CHAPTER 7 – ALTERNATIVE STRATEGIES

7.1 Introduction

Previous chapters of the Washington Aviation System Plan (WASP) created goals, objectives and performance measures; identified the existing system's infrastructure; evaluated emerging issues and the potential for impact to Washington's aviation system; estimated future demand; analyzed capacity constraints; and established a classification system and series of airport metrics. These prior analyses help to formulate needs of the system. To provide further insight and information that can be used in future decision making, alternative strategies were analyzed at the statewide, regional, and airport levels to provide additional data and approaches that can be considered.

At the statewide level, there are several emerging issues identified as having the potential for significant impact on the statewide airport system. These include the continued growth in unmanned aircraft systems, changes in airspace and FAA's NextGen technologies, and infrastructure funding challenges that continue to impact the health of the overall system. Alternative strategies that can be considered by WSDOT to facilitate and/or enhance the positive impact of these issues on the system and are outlined below.

Regionally, Washington's aviation system is diverse in the composition of airports, the activities served throughout each region, and the level of accessibility afforded by the airports due to regional topography, transportation infrastructure, and services available at airports. The system was analyzed on the regional level to determine redundancies, gaps, and opportunities in terms of capacity, accessibility, and activities that exist in the regions within the state. The regional analysis provides another layer of evaluation that can be used to inform decision making about future airport needs and the options or strategies available to leverage the positive aspects for airport development and support.

Finally, options or strategies available to individual airports in the system were identified. WSDOT recognizes that to have an effective airport system, airports need to leverage their existing capabilities and infrastructure, the aviation activities, and potential emerging issues to maximize their vibrancy, financial sustainability, and functionality. The airport metrics developed as part of the WASP provide a means of measuring how the airports are working toward creating a high functioning element of the entire statewide aviation system. Achieving these metrics will take time and to support their advancement specific strategies or options were identified for airports to consider implementing that can enhance or improve their future.

The following summarize the analysis in each of these three areas and identify potential alternative strategies for future consideration.

7.2 Statewide Alternative Strategies to Support Emerging Issues

As part of the WASP, considerable effort was expended on the evaluation of a wide range of emerging issues and how these issues are impacting and have the potential to affect Washington's future aviation system. In total, eight different issues were studied, four of which included the use of working groups to obtain input and different perceptions of the issues. Of the eight emerging issues, three were identified as having the potential to most significantly impact the state's aviation system in the near-term:

- Unmanned aircraft systems (UAS)
- NextGen implementation
- Airport infrastructure funding challenges

The following summarizes alternative strategies available to WSDOT to support these three emerging issues. These strategies are used to evaluate and inform future policy recommendations to improve the State's airport system and to adequately prepare for the future Washington air transportation system.

7.2.1 Unmanned Aircraft Systems (UAS)

UAS, also commonly referred to as drones, have revolutionized the National Airspace System (NAS) in recent years. Developments in UAS technology and growth in their demand and use in several industries have increased concern due to the current NAS not being tailored to accommodate manned and unmanned aircraft operating in the same environment. The FAA's vision for a modernized air transportation system, referred to as NextGen, has been under development and implementation for many years, with an evolving schedule for full implementation dependent on federal funding and a commitment by system users. However, the initial NextGen system did not anticipate accommodating UAS activity, especially at the levels being experienced and expected to be reached in the next 10 years. For UAS and manned aircraft to operate safely and efficiently in an integrated system within the NAS, continued study is needed that may affect policies at all levels.

Per the FAA's UAS website, "The FAA's vision for fully integrating UAS into the NAS entails UAS operating harmoniously, side-by-side with manned aircraft, occupying the same airspace and using many of the same air traffic management systems and procedures. This vision goes beyond the accommodation practices in use today, which largely rely on operational segregation to maintain systemic safety."

To identify potential statewide strategies to support the safe integration of UAS into the NAS and Washington's aviation system, a working group was established to discuss the wide-ranging issue and provide options for consideration. These options include actions that WSDOT could consider to assist and enable safe and effective UAS implementation in the state and are as follows:

- Facilitate a process for establishing GeoFencing and support the development and implementation of a universal standard
- Assist in the development of documentation to address new infrastructure requirements to support UAS ranging from power to hazardous materials disposal and others

- Encourage and promote establishment of zones where UAS activity might be prohibited or regulated for purposes such as safety, noise, privacy or inappropriate use
- Support and facilitate the development, clarification, and/or promulgation of procedures for close-proximity manned and unmanned aviation agriculture operations
- Actively engage the flying public in participation in the "Know Before You Fly" campaign or others that are subsequently developed
- Monitor and evaluate potential development of "droneports" and how these might be integrated into the Washington aviation system, including potential consideration of standards that might be promoted to ensure compatibility with the existing and future aviation system
- Serve as a repository of information for airports and UAS operators, compiling data, resources, and materials to promote the safe operation of drones in the NAS
- Engage in national dialogue on UAS activity on airports related to separating facilities and activities to promote both activities at existing airports
- Utilize existing outreach opportunities to promote awareness, education, and compliance with evolving regulation and standards

7.2.2 NextGen

Initiated in the early 2000s, the FAA has taken major steps to improve the NAS by implementing numerous NextGen initiatives. The full NextGen program, which consists of a series of more than 100 initiatives such as technology programs and procedure changes, profoundly affects the U.S. air traffic system. The implementation of NextGen is a complicated, nationwide process involving the FAA, state departments of transportation, airports, airlines, and individual aircraft operators. Anticipated benefits and effects of NextGen include:

- Flight efficiency and fuel savings
- Fewer delays and improved airport access
- Improved safety
- Environmental benefits (primarily air quality)

While recent implemented elements of NextGen have proven to be successful in terms of an upgrade to the legacy airspace system, in many instances, other areas of aviation have yet to integrate the new technologies and continue to rely on the soon-to-be outdated methods of utilizing the NAS. An important major milestone in the NextGen program occurs in 2020, the deadline for aircraft equipage requirements for operations in Class B airspace. This requirement has a major impact on general aviation aircraft that must have automatic dependent surveillance–broadcast (ADS-B) transmitter.

As part of the WASP, an analysis of how airports in the state are preparing for NextGen implementation was prepared. The analysis documented four key, fundamental elements:

- Wide Area Augmentation System (WAAS)
- Associated global positioning system (GPS) satellites
- FAA satellite-based approach procedures
- WAAS-enabled aircraft instrumentation

WAAS provides horizontal and vertical navigation capability for all phases of flight, including approaches, departures, and enroute operations. Area Navigation (RNAV) is a method of navigation that permits aircraft operations on any desired flight path within the coverage of ground or space-based navigation aids, or a combination of both.

To take advantage of the full benefits of NextGen technology and procedures, airports must have certain infrastructure in place. FAA's requirements may require runway and taxiway widening; parallel taxiways; taxiway relocation; runway and taxiway lighting; and obstruction lighting, marking, and removal. Other actions include airport master plan and airport layout plan updates, obstruction surveys and obstruction removal, and land acquisition for runway safety areas and runway protection zones, approach protection, and acquisition of avigation easements.

Currently, any user can request an improved approach procedure for an airport. All new approaches fall into the NextGen realm, with development of approaches such as Performance Based Navigation (PBN), Required Navigation Performance (RNP), and vertically guided approaches, typically Localizer Performance with Vertical guidance (LPV). However, these requests are not vetted through WSDOT or in some cases through the airports to evaluate the infrastructure to determine the ability of the airports to support the procedure.

As an alternative, WSDOT can assist airports and the system through an evaluation of the capabilities and needs of the entire statewide airport system, developing a prioritized list of airports for which new NextGen procedures could best benefit the state system. For example, the Puget Sound Regional Council (PSRC) evaluated its regional system needs and worked closely with FAA to determine how NextGen can improve the accessibility of the system. This regional approach is beneficial to the Seattle-Tacoma area, however, this focused effort could be expanded to evaluate the opportunities and needs of the state system.

WSDOT is engaged at the national level with other states in supporting NextGen implementation that benefits all users, while identifying the challenges that exist in each state specific to their conditions and environment. As part of the WASP, WSDOT Aviation convened a working group to evaluate and discuss NextGen implementation and provide options for consideration. These options include actions that WSDOT could consider to assist with NextGen implementation in the state and are as follows:

- Continue the statewide airports geographic information system (AGIS) project to support NextGen implementation at select airports
- Explore and pursue the streamlining of avionics hardware and software certification to reduce costs for the pilot community and increase the availability
- Pursue legislation addressing geo-fencing and reduce the need for ADS-B
- Work with airport sponsors and the FAA's Flight Standards to communicate changes to approach procedures associated with NextGen
- Partner with education institutions and the aerospace industry to increase the number of individuals in the career field of avionics through marketing and education to meet demand caused by the ADS-B Out rule taking effect on January 1, 2020
- Develop a brochure to educate airport sponsors on how to protect airports from obstructions

7.2.3 Infrastructure Funding Challenges

Airport infrastructure preservation and development is critical to enhance safety and security, and meet capacity demands. Infrastructure preservation and development is an ongoing process that requires large amounts of funding to sustain an effective aviation system and funding challenges continue to be experienced by airports of all sizes. The funding needs are not only for infrastructure, but also day-to-day operational requirements to keep airports running. With constantly increasing costs and sometimes limited resources available to airports, especially for capital infrastructure projects, WSDOT and airport owners and sponsors continue seeking both traditional and innovative solutions to funding challenges.

Challenges and potential solutions for infrastructure funding were studied by WSDOT in the *Airport Investment Study* (also called Phase I, with the subsequent Airport Investment Solutions Study sometimes referred to as Phase II). The study identified thirty-three (33) preliminary solutions to address both funding and non-funding related implementation strategies. The solutions were categorized into the following: New Funding Sources; Refinements of Current Funding Programs; Revisions to Current Funding Sources; and Other Potential Solutions. Of these 33 solutions, ten (10) core study solutions were identified and recommended for performance analyses. These 10 solutions were those that scored highest against a set of screening and evaluation criteria to help ensure the solutions are "feasible, acceptable, suitable, distinguishable and complete." The full *Airport Investment Solutions Study* that documents the 33 preliminary and 10 core study solutions can be accessed at http://www.wsdot.wa.gov/aviation/AirportInvestmentStudy.htm

During the WASP, other funding related challenges were identified such as the inability of current WSDOT Aviation funding to allow for lower priority projects to receive funding and the costs of airport management and maintenance functions for many small airports. WSDOT Aviation convened a working group to further evaluate and discuss aviation infrastructure and other funding challenges and provide additional options and strategies for consideration. The actions identified by the working group and throughout the WASP for WSDOT consideration are as follows:

- Evaluate a program related to reduced infrastructure standards for non-NPIAS airports, including vetting optimized infrastructure and safety standards
- Evaluate WSDOT Aviation's current funding project prioritization program to determine if separate "pools" of funding could be set aside to address low priority projects that are unlikely to be funded with the current program, possibly through use of specific functional or regional needs based on the outcomes of the WASP
- Develop interim guidance to airports and requests/grants of temporary exemption from standards with an accompanying roadmap or plan for the requesting airport that outlines improvement goals with milestones and benchmarks
- Evaluate opportunities to voluntarily opt out of the aviation system, which could release an airport sponsor from any responsibility to meet state standards and include an accompanying release of eligibility for grants and loans from the state Airport Aid Program
- Support the continuation of the Advisory Committee membership from the Airport Investment Solutions Study or a similar group to continue the momentum developed during the study regarding the importance of finding state funding solutions to assist with the funding needs

- Solidify support from groups such as the Washington State Aviation Alliance (WSAA), Washington Pilots Association (WPA), WAMA, and/or the WSCAA to help lobby the state legislature to vote in favor of legislation that supports one or more of the funding solutions
- Work with airport sponsors to identify aviation-supportive state legislators that could draft and support legislation for solutions that would benefit the airport system
- Build support from aviation-supportive officials to consider development of a task force or work group within the legislature to evaluate the top funding solutions, including consideration of fiscal analysis, that could be used to determine the potential solution that may receive the highest support in the full legislature
- Support implementation of regional airport system commissions or airport authorities or similar recognized organizations that could combine multiple airports under a single administration, association, or partnership to reduce costs to each individual airport sponsor

7.3 Regional Airport Needs and Alternative Strategies

An understanding of the system at a regional level is an important consideration of the WASP's analysis. The regional analysis provides additional data and analysis that indicates if there are areas of the state that are deficient in any key aviation services and metrics, examines the system's redundancies, gaps, and opportunities, and identifies potential strategies or options that may be considered in development of recommendations. The regional evaluations include analysis of the following:

- Capacity – airfield and aircraft storage
- Aviation activities
- System accessibility

Significant data were necessary to conduct the regional analysis. There were a variety of sources utilized to support the evaluation. Data collected as part of the inventory effort was used to identify the level of aviation activities at each airport. The aviation activities were examined to determine how many airports supported the various activities, indicating redundancies and opportunities in various Washington regions.

Another analysis evaluated airports that provided facilities and services that typical business aviation users are seeking, indicating the locations and accessibility of the system to these users. Specific criteria were established identifying the most critical factors to typical business aviation users and data from the inventory also supported this analysis.

Airfield operational and storage capacities were determined through previous WASP efforts and compared to WASP forecasts to yield a demand to capacity ratio for both airfield capacity and aircraft storage. These capacity analyses were examined on the regional level to determine if there were opportunities for other airports to provide supplemental service or support where deficiencies existed.

Finally, a Geographic Information System (GIS) analysis was used to evaluate the accessibility of the system. Drive times within the various system classifications, as well as coverage and accessibility of commercial air service were developed to determine how well the state's population was served by the system of airports.

These analyses are documented in the subsequent sections.

7.3.1 Capacity Evaluation

Capacity is a critical component of the overall efficiency of Washington's airport system. The ability to provide for and accommodate current and future demand is critical to the overall success of the system. As such, an analysis was conducted to determine which airports in Washington are anticipated to have capacity issues over the next 20 years (through 2034). For this analysis, both airfield capacity and aircraft storage capacity were investigated. Overall, the analysis shows that airfield capacity issues are localized to the metropolitan area surrounding Seattle, while aircraft storage capacity is a bigger issue around the

state at numerous airports. The following two sections provide more information regarding the capacity at Washington's airports.

Airfield Capacity

In Chapter 5 of the WASP, annual airfield capacity was analyzed and documented. To examine annual airfield capacity, each airport's annual service volume (ASV) was calculated. ASV is a measure of an airport's ability to process annual operational activity based on airport characteristics, such as airfield configuration and fleet mix. Each airport's ASV was either calculated using the methodologies contained in FAA AC 150/5060-5, *Airport Capacity and Delay*, or obtained from a recent airport master plan. More information on the airfield capacity analysis can be found in Chapter 5.

While Seattle-Tacoma International Airport (SEA) was included in this WASP analysis, SEA calculates capacity and demand on an hourly basis (not annual) for its planning purposes in determining needed capacity improvements at the airport. It should also be noted that SEA is currently undertaking an Airport Master Plan but the capacity analysis was not available at the time of the WASP analysis.

For this study, airfield capacity was analyzed over four thresholds: under 60 percent, between 60 and 80 percent, between 80 and 100 percent, and above 100 percent. The FAA recommends that planning for capacity improvements should start when the 60 percent threshold is passed and that implementation of the improvements should be underway at 80 percent. The WASP analysis shows that in 2034 there will be four airports operating between 60 and 80 percent of their capacity, one airport operating between 80 and 100 percent capacity, and one airport operating above 100 percent capacity. A graphical depiction of this information is provided in Figure 7-1.

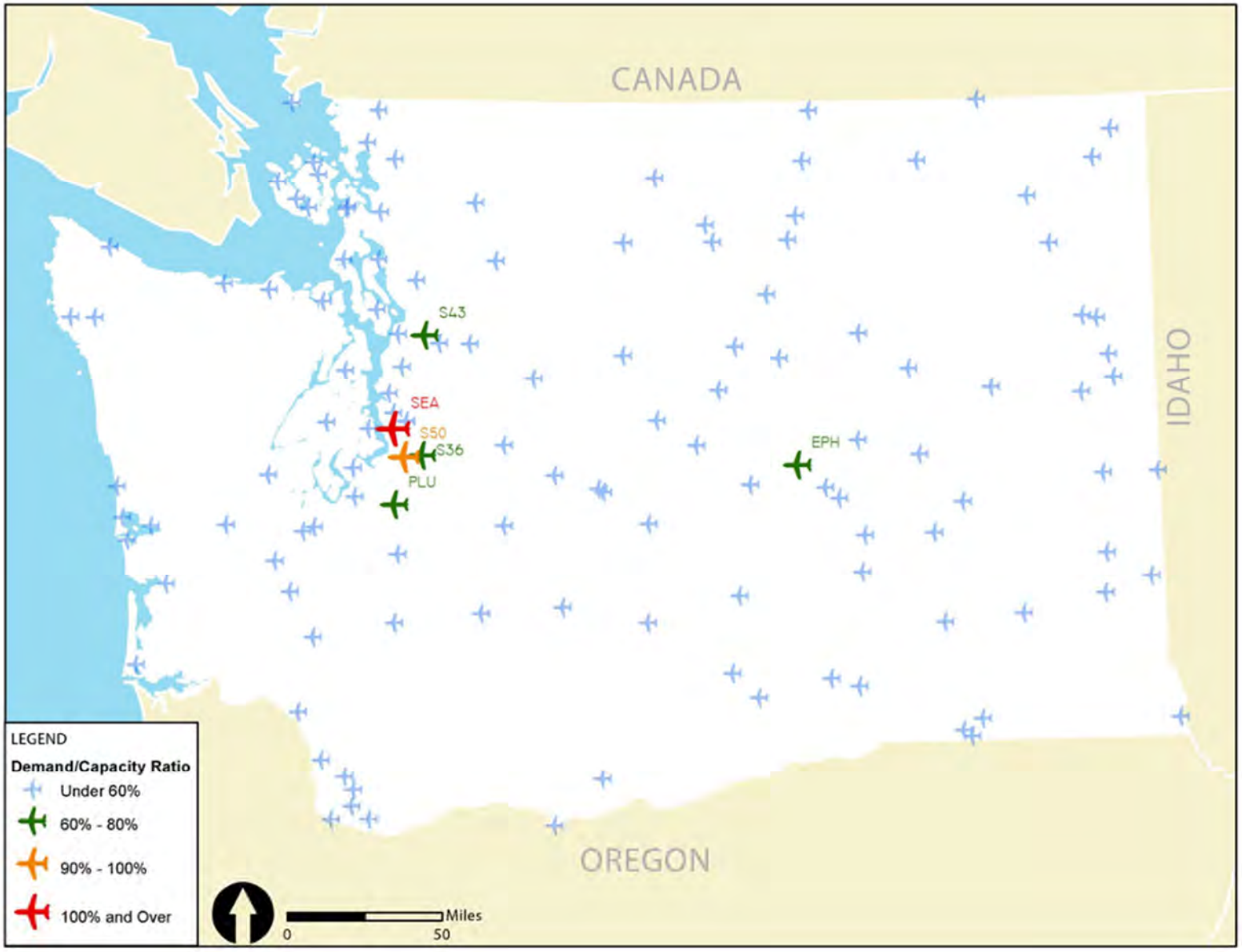
Most of Washington's airports do not appear to have an airfield capacity issue based on the WASP's high level analysis. SEA may exceed its annual airfield operating capacity by 2034 if its current ASV does not change in the future. SEA's Master Plan will include an updated airfield capacity analysis which will document the hourly capacity and any future capacity needs. A summary of airports that were identified to have potential airfield capacity constraints are provided in Table 7-1.

Table 7-1. Airfield Capacity

AIRPORT NAME	ID	CAPACITY RATIO
Sea-Tac International	SEA	103%
Auburn Municipal	S50	96%
Ephrata Municipal	EPH	68%
Harvey Field	S43	68%
Crest Airpark	S36	64%
Pierce County | Thun Field	PLU	63%

Source: WASP analysis.

Figure 7-1. 2034 Airfield Capacity Constraints



As shown in Figure 7-1, of the six airports with demand to capacity ratios estimated to be over 60 percent in 2034, five are in the Northwest region of the state, with only Ephrata Municipal located outside of the Puget Sound region. This concentration of airports with capacity constraints in the largest metropolitan area in the state is of concern. Providing sufficient capacity in the region is of critical importance to ensure the continued interest in development of the region and population growth, with aviation supporting the region's development.

To mitigate against the potential issues that can be caused by having a concentration of airports that have capacity-related delays, options should be considered for how to best address these issues on a regional basis. There are three options that are typically evaluated to address operational capacity deficiencies:

1. Do nothing
2. Infrastructure improvements
3. Use of "reliever" facilities

The do-nothing scenario assumes airports will not take any actions to improve capacity or reduce delay, and that delays will be accepted or demand will naturally adjust. The adjustment could be a relocation of activity to less congested facilities. It is also possible that users will operate at different times or operate less frequently.

Infrastructure improvements could include several developments that could relieve congestion at an airport. Examples include building a new runway and/or taxiways or improving the instrumentation abilities such as improved approaches. Another potential option could be development of an air traffic control tower for non-towered airports, however, this option has a low probability in the current environment. Future use of remote air traffic control does present an opportunity, but a timeline for the conclusion of the pilot program and actual implementation of remote towers has not yet been established.

Depending on the airport experiencing the capacity constraint, other airports could be considered "relievers" either officially by the FAA or just recognized as facilities that could be used by operators that are in proximity to the airport with the capacity issue. FAA has specific criteria for designation as a reliever airport, but the designation does not have significant meaning and airports can serve as relievers without the designation. The use or reliance on reliever airports to provide capacity relief cannot be mandated and typically has been used to relieve general aviation demand from commercial service airports.

Similar to reliever airports, when the capacity issue exists at commercial service airports, development of commercial service at other airports has also been promoted to offer alternatives to passengers. Many large metropolitan areas have several commercial service airports that provide alternatives and act as a system. Some of the systems are operated by a single entity while others are operated independently with each airport looking to serve different niches either within the industry or the region being served.

Given that the most significant operational capacity concerns identified in the WASP are in the Seattle region and that there is a mix of commercial and general aviation capacity constraints, a more thorough capacity study is needed to evaluate the issues and opportunities available in the region.

Aircraft Storage Capacity

Being able to serve airport users with facilities that meet their needs is an important aspect of the Washington airport system. An analysis of aircraft storage capacity was completed to evaluate needs of the airports and to examine the capacity constraints on a regional basis. For purposes of the WASP analysis, aircraft storage was measured by looking at the ratio of the number of based aircraft forecast at each airport in 2034 as a percentage of the existing available storage spaces at each airport. Four thresholds were used to determine the storage capacity concerns: under 60 percent, between 60 and 80 percent, between 80 and 100 percent, and above 100 percent. As shown in Figure 7-2, the WASP analysis shows that Washington will have a significant shortage of aircraft storage capacity by 2034. In total, there will be 56 airports that are anticipated to have capacity issues by 2034, defined as having a ratio of greater than 80 percent of their available storage capacity utilized by projected based aircraft. Of these, 47 airports are estimated to be over 100 percent capacity for aircraft storage and 11 airports between 80 and 100 percent of existing available storage capacity. In addition, 15 airports are estimated to have a storage demand to capacity ration between 60 and 80 percent (see Table 7-2). These anticipated aircraft storage limitations are spread across all WSDOT regions and affect airports of all sizes. More specifically, the Northwest region is showing the most instances of storage issues (18) while the Olympic and South Central Regions reported the least (nine) (see Table 7-3). More information on the airfield capacity analysis can be found in Chapter 5.

Table 7-2. 2034 Aircraft Storage Capacity

CAPACITY RATIO	NUMBER OF AIRPORTS
Under 60 percent	62
Between 60 and 80 percent	15
Between 80 and 100 percent	11
Over 100 percent	47

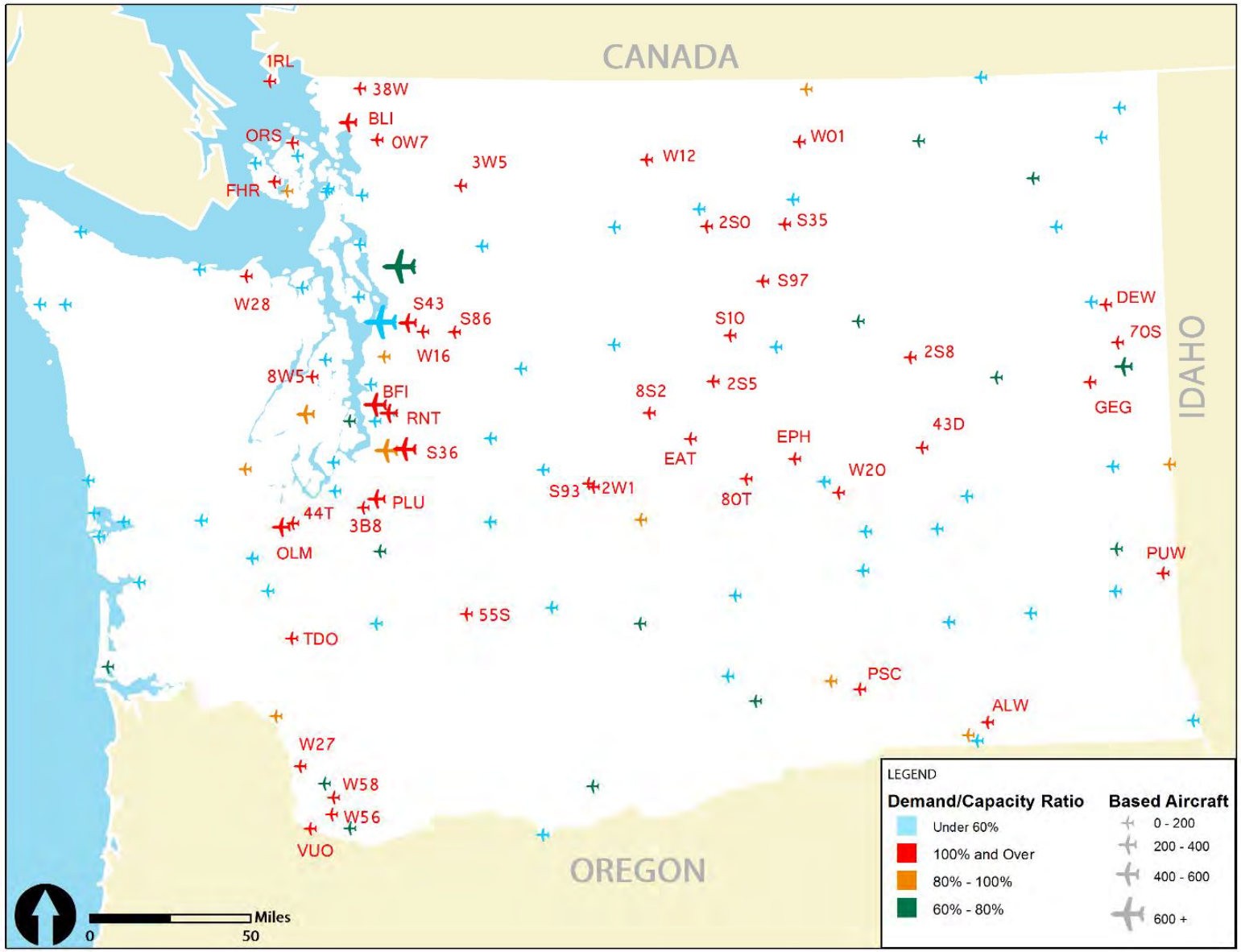
Source: WASP analysis.

Table 7-3. Airports Over 60 Percent Capacity by Region

WSDOT REGION	NUMBER OF AIRPORTS OVER 60% CAPACITY
Eastern	12
North Central	14
Northwest	18
Olympic	9
South Central	9
Southwest	11

Source: WASP analysis.

Figure 7-2. 2034 Aircraft Storage Capacity



The airports that are expected to be over 60 percent capacity are comprised of the following airport classifications:

- Major – 7 airports (70 percent of all Major airports)
- Regional – 15 airports (75 percent of all Regional airports)
- Community – 29 airports (83 percent of all Community airports)
- Local – 12 airports (32 percent of all Local airports)
- General Use – 10 airports (29 percent of all General Use airports)

As shown, a significantly higher percentage of Community, Regional, and Major airports are expected to experience a storage capacity deficiency by 2034. Focusing storage capacity solutions at these airports may help to assist in mitigating this potential future issue. Consideration should be given to planning and providing for storage facilities to be developed around the state and specifically at airports expected to experience over 100 percent of their existing operational capacity. Currently, there are two options for addressing the aircraft storage capacity issues that are anticipated in 2034:

1. Do nothing
2. Develop additional storage facilities

Under the do-nothing scenario, the market would dictate people's choices and those that wished to use aircraft storage facilities would find a location that had availability, or if they were considering a new aircraft purchase, they may not proceed with the purchase until adequate storage was located. This might also mean that some aircraft owners would not obtain the type of storage they desire (such as a T-hangar or conventional/box hangar) or others may drive further than they want to find acceptable facilities.

Airports typically do not build storage facilities until demand warrants due to the cost of development and ensuring a return on the investment. The WASP analysis is more of a high-level evaluation and was conducted to determine if there were specific regions of the state where storage facilities were likely needed to serve future demand. Airport master plans may identify potential storage needs, but are typically looking only at the individual airport's needs, not at a regional level.

Capacity Summary

The regional evaluation of both operational and storage capacity provides WSDOT and all the airports with information that could be useful in determining need to address operational capacity deficiencies and the opportunities for development of additional storage.

In terms of operational capacity, the analysis revealed that in 2034 there will be four airports operating between 60 and 80 percent of their capacity, one airport operating between 80 and 100 percent capacity, and one airport operating above 100 percent capacity (SEA). At the statewide level, it does not appear that Washington has major airfield capacity concerns; however, SEA is the primary commercial service airport in the state and is reporting a demand capacity ratio of 103 percent in 2034. Several of the other airports in the Seattle region also are expected to experience capacity constraints, indicating the need for a more thorough capacity study to evaluate the issues and opportunities available in the region.

For storage capacity, considerations such as current airport hangar waiting lists, available developable land, and funding are all critical elements of each airport's decision-making process when determining if

additional storage will be sought. The WASP analysis provides further input into this process by showing that in some regions, aircraft storage deficiencies are anticipated and that even though an individual airport's current waiting list may not reveal high demand, within the region there may be opportunities to attract additional aircraft if storage were provided. Each airport needs to evaluate the opportunities, constraints, and regional marketplace to make the best decision regarding developing new storage facilities.

An important issue for WSDOT is examining funding options that might be available to assist airports who desire additional storage but do not have the resources to construct the facilities.

Because funding can be difficult to obtain, options for different funding programs must also be considered. Options include a revolving loan program could be established through the State, public private partnerships, aviation clubs, or other similar ventures.

7.3.2 Activity Evaluation

Washington's airport system supports a wide variety of aviation activities that play an integral role in supporting numerous industries across the state. As part of WSDOT Aviation's Economic Impact Study, 17 aviation activities were identified that provide "value to users". The 17 activities include:

- Commercial passenger service
- Business and corporate travel
- Personal transportation
- Pilot training and certification
- Air cargo
- Blood, tissue, and organ transportation
- Medical air transport
- Search and rescue
- Firefighting
- National security
- Emergency preparedness and disaster response
- Aircraft manufacturing
- Agriculture
- Scientific research
- Aerial photography
- Aerial sightseeing
- Skydiving

All activities are not accommodated at every airport and some airports only focus on one or two activities. The activities also have some linkages such as air cargo and commercial passenger service due to the type of aircraft that are operated and the facilities that these operators require. Others such as scientific research, aerial photography, national security, and blood, tissue, and organ transportation do not require a specific type of aircraft and can be supported at nearly any size airport, depending on the user's needs.

An activity such as commercial passenger service is a critical activity in the state, however, airlines decide where to provide this service and airports have a limited opportunity to influence this activity (other than by providing a subsidy to attract an airline).

Of the 17 activities (and not including commercial passenger service), five were identified as having a significant impact on airport facility needs and serving the economic needs of the state, including:

- Agriculture
- Pilot training and certification
- Business and corporate travel
- Air cargo
- Aerospace manufacturing

The evaluation of where the activities are supported throughout the system helps to identify where potential redundancies, gaps, and opportunities in new activities or services may exist. To determine this, a GIS analysis was conducted to determine the number of airports that support high levels of certain activities in each WSDOT region. The analysis provided below summarizes the activities that airports self-reported during the WASP inventory survey. It should be noted that data provided below is self-identified by the airport and responses were provided as either "yes" or "no." Therefore, the quality and level of activity is not known. For reference, the number of airports in each WSDOT region is provided in Table 7-4.

Table 7-4. Number of Airports by Region

WSDOT REGION	NUMBER OF AIRPORTS BY REGION
Eastern	21
North Central	24
Northwest	36
Olympic	25
South Central	16
Southwest	14

Source: WASP analysis.

The analysis revealed that across all WSDOT regions there is a good mix of these five activities at the airports in the system. In general, the Eastern, North Central, and Northwest regions have the most airports with all five of these activities, while the Olympic, South Central, and Southwest regions have the fewest airports with the five activities.

The following sections provide an overview of the primary aviation activities that were identified in each WSDOT region.

Agricultural Activities

Across all regions, 46 airports reported supporting agricultural activity. Agricultural activity is primarily concentrated in the Eastern (11 airports) and North Central (13 airports) regions (see Table 7-5). As shown in Figure 7-3, there is a heavy concentration of agricultural activity in the northeast portion of the state. Because there is a significant amount of farm land in this area, the presence of agricultural activities at airports supports this industry.

Table 7-5. Agricultural Activity by Region

WSDOT REGION	NUMBER OF AIRPORTS WITH ACTIVITY (PERCENT OF TOTAL IN REGION)
Eastern	11 (52 percent)
North Central	13 (54 percent)
Northwest	6 (17 percent)
Olympic	3 (12 percent)
South Central	9 (60 percent)
Southwest	5 (36 percent)

Source: WASP analysis.

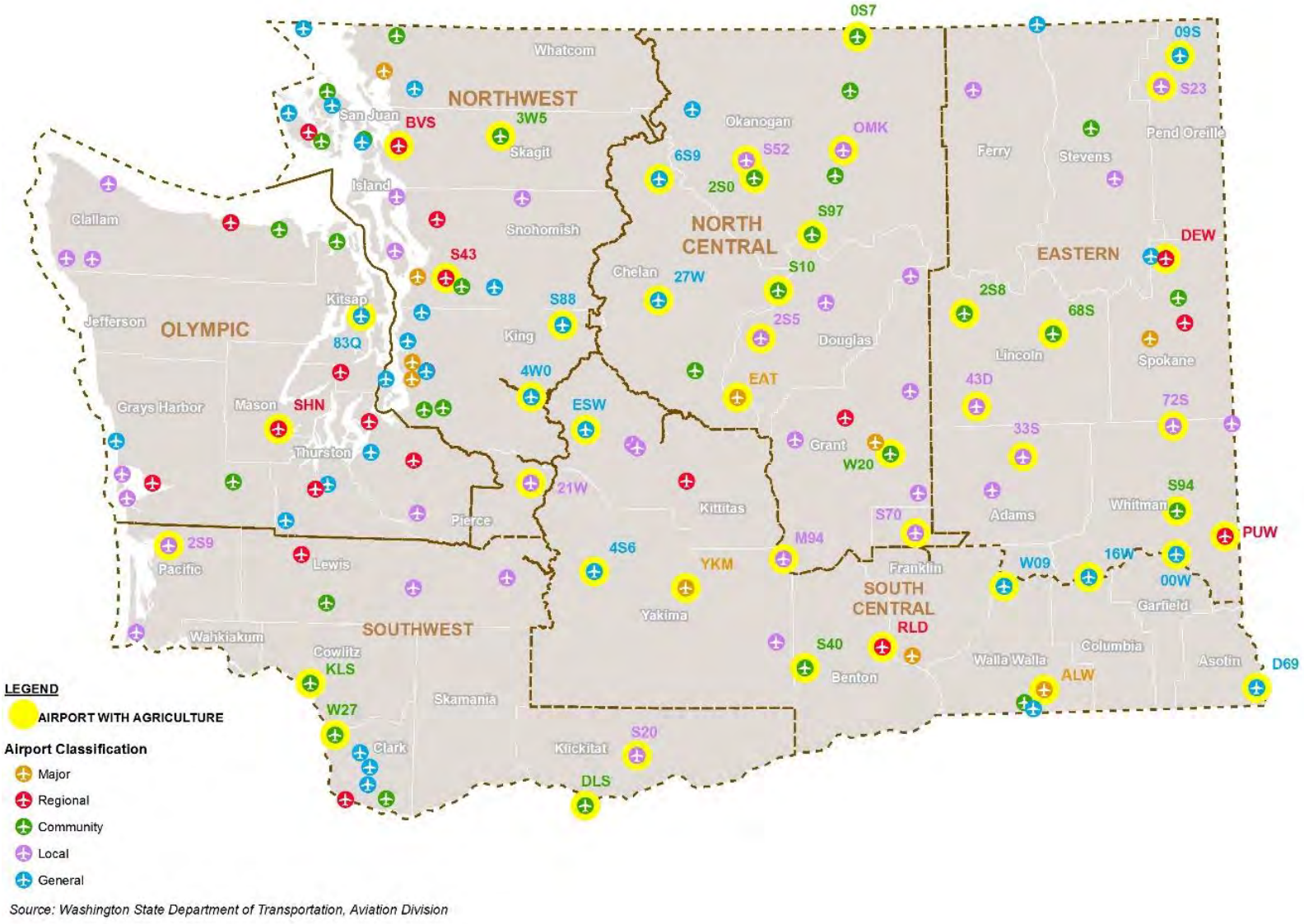
The analysis also examined the classifications of airports that support each of the activities. Based on the responses to the survey, the following number of airports in each classification indicated they serve agricultural activities:

- Major – 3 airports (30 percent of a Major airports)
- Regional – 6 airports (30 percent of all Regional airports)
- Community – 13 airports (37 percent of all Community airports)
- Local – 12 airports (32 percent of all Local airports)
- General Use – 12 airports (35 percent of all General Use airports)

Based on these findings, agricultural activity is well supported at a relatively even percentage of airports in each classification group, even though it is focused in the Eastern and North Central regions.

To support agricultural activities, an airport would need to be in proximity to areas that support agriculture. This activity does not present an area of potential growth in most cases and is not an activity that generates significant revenue for an airport. It is a critical activity to the state in support of the agricultural sector of the economy and ensuring this sector can thrive.

Figure 7-3. Agricultural Activity by Region



Source: Washington State Department of Transportation, Aviation Division

Pilot Training and Certification

Pilot training and certification is the most common activity found at Washington's airports. Across all regions, 72 airports reported supporting pilot training and certification activity. As shown in Table 7-6, this activity is evenly distributed across all regions, though the Southwest reported the lowest figures. The North Central region had the most activity at 18 airports reporting having pilot training. As shown in Figure 7-4, coverage is spread throughout the state, with very few identifiable gaps in coverage.

Table 7-6. Pilot Training and Certification Activity by Region

WSDOT REGION	NUMBER OF AIRPORTS WITH ACTIVITY (PERCENT OF TOTAL IN REGION)
Eastern	12 (57 percent)
North Central	14 (58 percent)
Northwest	18 (50 percent)
Olympic	9 (36 percent)
South Central	13 (87 percent)
Southwest	6 (43 percent)

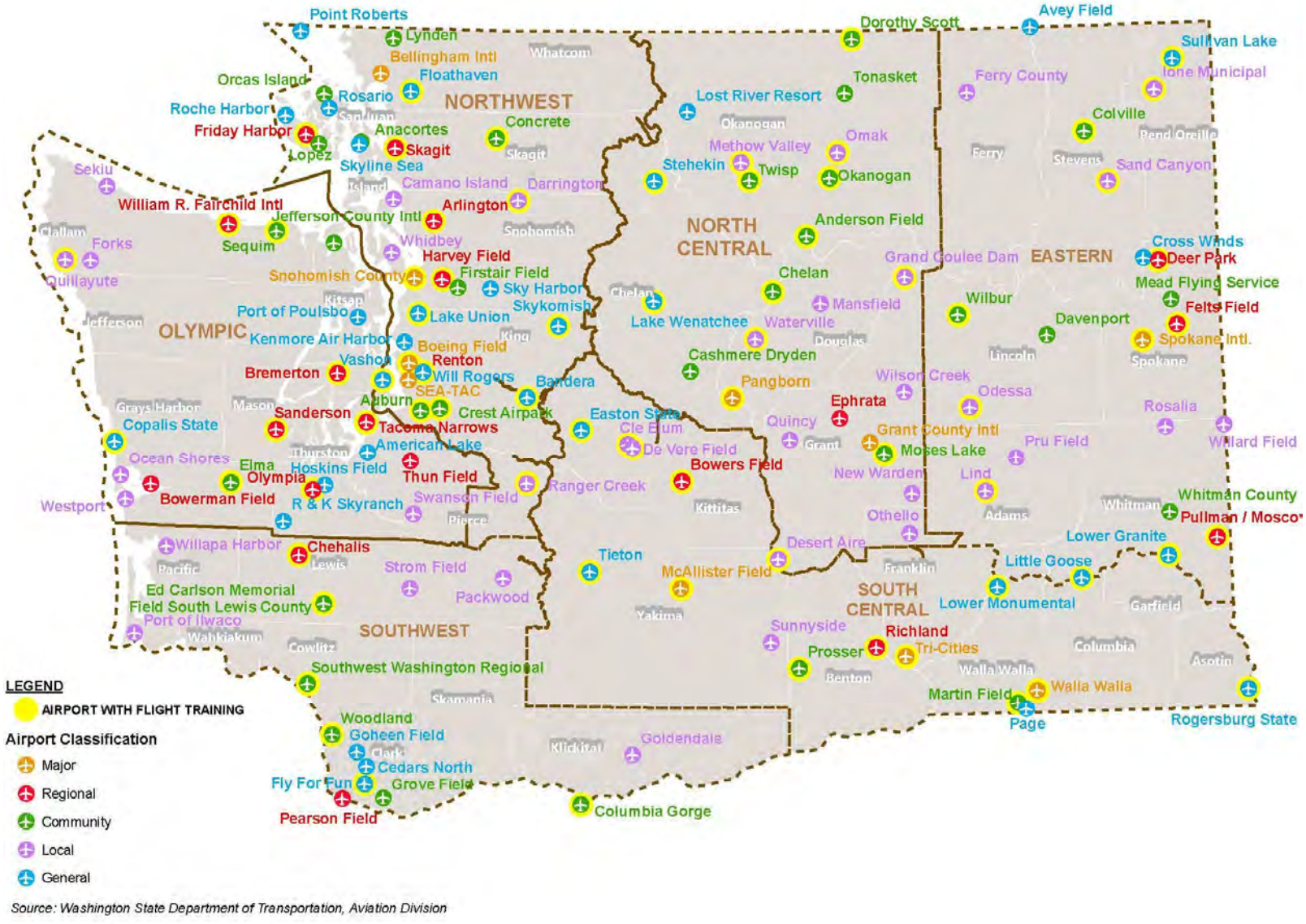
Source: WASP analysis.

Based on the responses to the survey, the following number of airports in each classification indicated they serve pilot training and certification activities:

- Major – 7 airports (70 percent of a Major airports)
- Regional – 6 airports (30 percent of all Regional airports)
- Community – 19 airports (54 percent of all Community airports)
- Local – 13 airports (35 percent of all Local airports)
- General Use – 17 airports (50 percent of all General Use airports)

It is interesting that most of the Major and Community airports in the state reported supporting pilot training and certification and that the lowest levels were at Regional and Local airports. This may be a reflection of self-reporting, but also likely that several of the Major airports are smaller commercial service airports (not SEA or GEG). Many beginner pilots prefer to start training at smaller airports such as those identified as Community, Local, and General Use (although General Use airports do not have a paved surface). Pilot training can be a significant revenue generator for an airport depending on the type of school and level of students supported. This training also typically generates a high level of operations at an airport which would be a concern at airports that have an identified operational capacity constraint. The analysis shows that the state is well supported and provides significant opportunities for pilot training at all sizes of airports and at locations throughout Washington.

Figure 7-4. Pilot Training and Certification Activity by Region



Source: Washington State Department of Transportation, Aviation Division

Business and Corporate Travel

Business and corporate travel activity was identified at 52 airports across the state. It is important to note that this data was self-reported by airports and likely reflects a wide range of "business" aviation. The range is reflected primarily in the types of aircraft used for business purposes which can include jet, turboprop, and piston engine aircraft as well as rotorcraft. These aircraft have varying airport facility needs such as runway length and strength, from 5,000 feet in length and able to accommodate aircraft above 12,500 pounds to 3,500 feet or less and weights below 12,500 pounds. This wide range is reflected in the airport-reported data on those that are accommodating business and corporate travel.

As shown in Figure 7-5 and Table 7-7, there is business activity in all WSDOT regions, but it is most highly concentrated in the Northwest and Eastern regions. This is likely due to these regions having the two largest population centers in the state and therefore, are more likely to have businesses that require aviation business transportation. Across all regions, the southern portion of the state (South Central and Southwest regions) has the lowest concentration of business activity, likely due to the rural nature of the area.

Table 7-7. Business and Corporate Travel Activity by Region

WSDOT REGION	NUMBER OF AIRPORTS WITH ACTIVITY (PERCENT OF TOTAL IN REGION)
Eastern	11 (52 percent)
North Central	8 (33 percent)
Northwest	13 (36 percent)
Olympic	9 (36 percent)
South Central	6 (40 percent)
Southwest	5 (36 percent)

Source: WASP analysis.

Based on the responses to the survey, the following number of airports in each classification indicated they serve business and corporate travel activities:

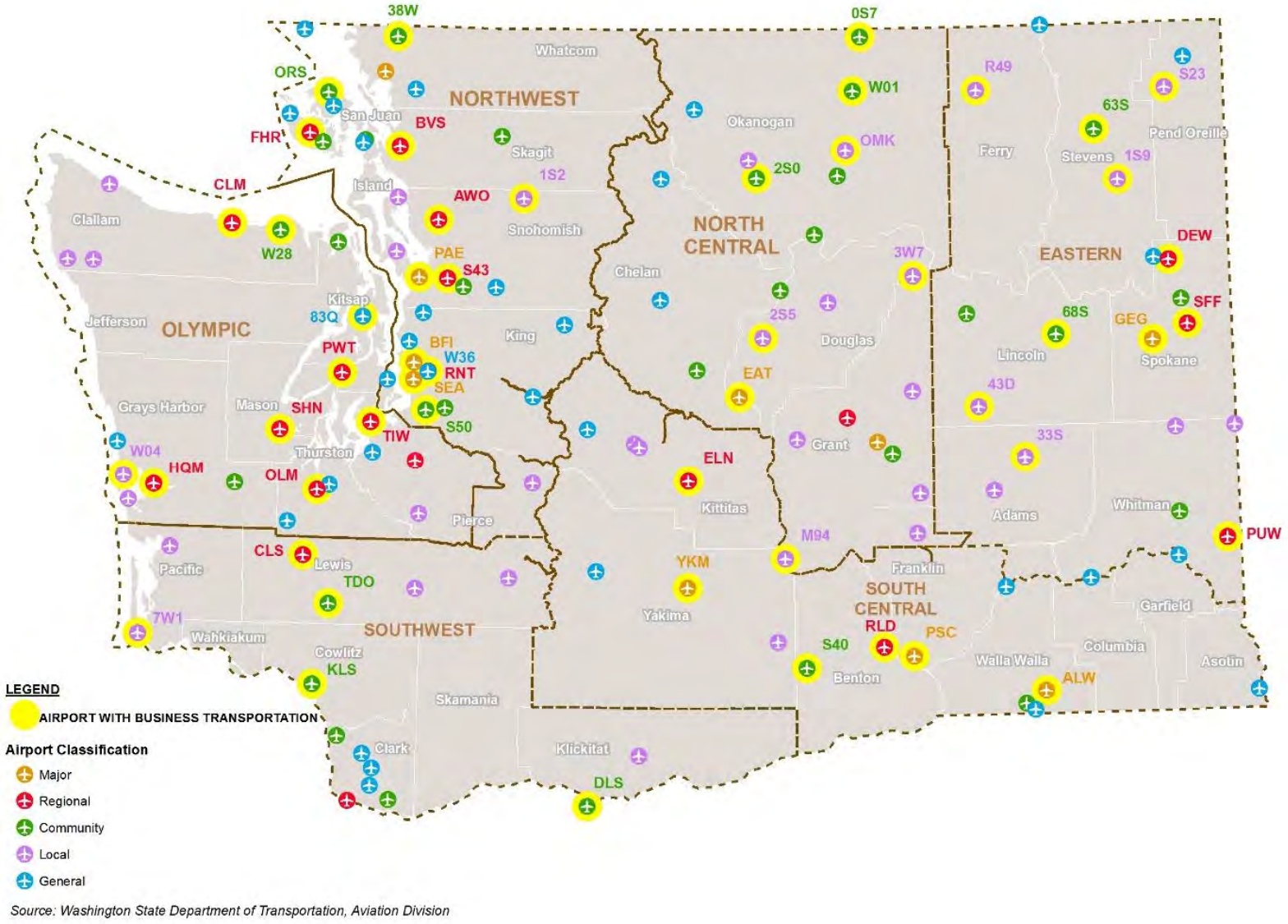
- Major – 8 airports (80 percent of a Major airports)
- Regional – 17 airports (85 percent of all Regional airports)
- Community – 15 airports (43 percent of all Community airports)
- Local – 12 airports (32 percent of all Local airports)
- General Use – 2 airports (6 percent of all General Use airports)

Based on the airport classifications summary provided in Chapter 6, business and corporate travel activity is typically focused at Regional and Community airports and is least likely to be needed at Local or General Use airports. As noted above, many Major airports also report serving business and corporate

travel primarily due to their location in the larger, more populated areas of the state which are where more businesses are located.

Business and corporate activity can be a major source of revenue, especially the activity served by jet aircraft. These aircraft buy more fuel, but the operators are also seeking services such as rental cars, catering, and other FBO services to support the pilots that sometimes are transporting the business travelers.

Figure 7-5. Business and Corporate Travel Activity by Region



Source: Washington State Department of Transportation, Aviation Division

Air Cargo

Air cargo activity was identified as being supported at 22 airports in Washington. As shown in Figure 7-6 and Table 7-8, most of these airports are in the Northwest region, most likely attributable to the concentration of population in that area. The Southwest region reported having no airports that supported air cargo activity; this is the only instance of a region not being served by an airport activity.

Table 7-8. Air Cargo Activity by Region

WSDOT REGION	NUMBER OF AIRPORTS WITH ACTIVITY (PERCENT OF TOTAL IN REGION)
Eastern	2 (10 percent)
North Central	5 (21 percent)
Northwest	8 (22 percent)
Olympic	4 (16 percent)
South Central	3 (20 percent)
Southwest	0

Source: WASP analysis.

Based on the responses to the survey, the following number of airports in each classification indicated they serve air cargo activities:

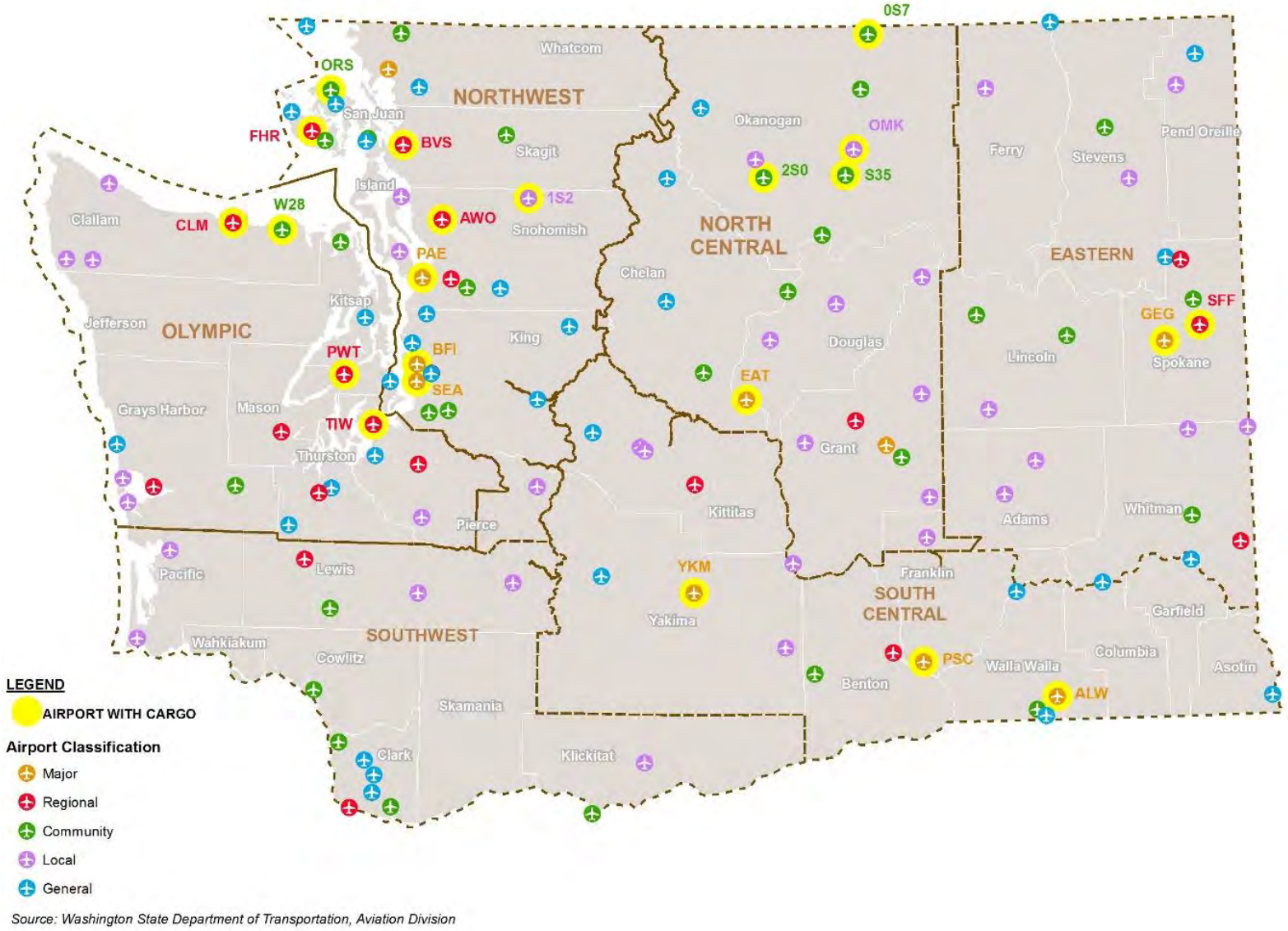
- Major – 8 airports (80 percent of a Major airports)
- Regional – 7 airports (35 percent of all Regional airports)
- Community – 5 airports (14 percent of all Community airports)
- Local – 2 airports (5 percent of all Local airports)
- General Use – None

As noted, cargo is primarily supported at Major and Regional airports. This is consistent with the fact that these airports can handle larger aircraft and are in populated areas. It is also important to note that many of the larger cargo airlines want to operate at commercial airports to have access to the "belly" of the planes at these airports. The cargo carriers make their own decisions about which airports they choose to operate at and consider other factors such as locations of demand generators and supporting industries.

Though no General use airports and only two Local airports reported having cargo activity, it is likely that these facilities can't accommodate the carriers that provide this service nor do they have the necessary facility infrastructure. It is likely that if additional cargo facilities are needed, they would be provided at the existing airports or at other Major or Regional airports.

Air cargo activity can also generate significant revenue for airports from the purchase of large quantities of fuel to leasing land and/or buildings and paying applicable landing fees. This activity is highly sought after by airports due to revenue, but also due to the opportunity to support their community's attractiveness to business development.

Figure 7-6. Air Cargo Activity by Region



Source: Washington State Department of Transportation, Aviation Division

Aerospace Manufacturing

Of the five activities examined in this analysis, aerospace manufacturing had the fewest airports reporting serving this activity. As shown in Figure 7-7 and Table 7-9, all regions are served by a combined total of 16 airports that serve aerospace manufacturing. Of these, the largest concentration is in the Northwest region, where a large majority of the population and the Boeing Company are located. Outside of the Northwest, no other region reported having more than three airports serving this activity.

Table 7-9. Aerospace Manufacturing Activity by Region

WSDOT REGION8	NUMBER OF AIRPORTS WITH ACTIVITY (PERCENT OF TOTAL IN REGION)
Eastern	2 (10 percent)
North Central	2 (8 percent)
Northwest	7 (19 percent)
Olympic	1 (4 percent)
South Central	3 (20 percent)
Southwest	1 (7 percent)

Source: WASP analysis.

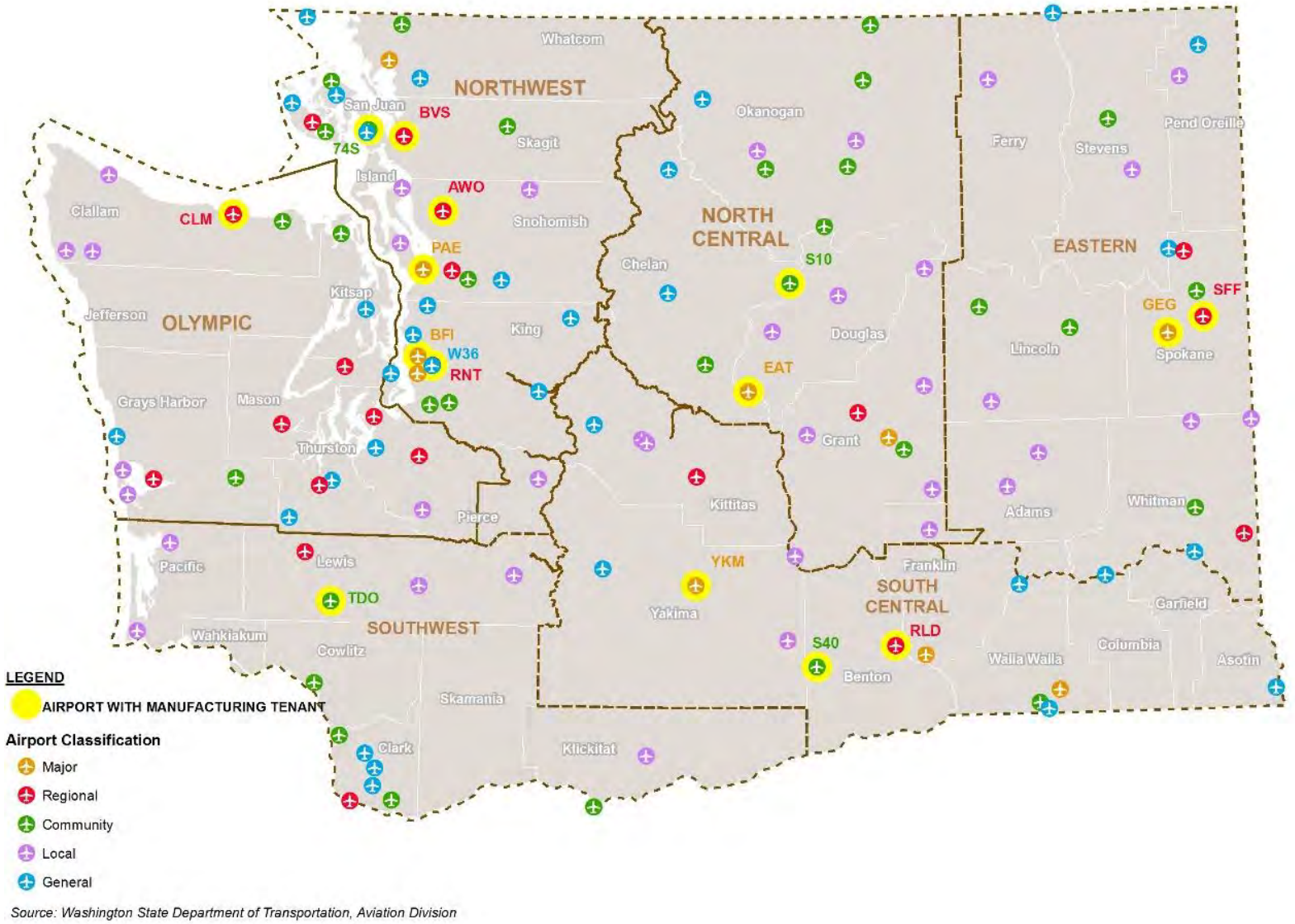
Based on the responses to the survey, the following number of airports in each classification indicated they provided aerospace manufacturing activities:

- Major – 5 airports (50 percent of a Major airports)
- Regional – 6 airports (30 percent of all Regional airports)
- Community – 4 airports (11 percent of all Community airports)
- Local – None
- General Use – 1 airport (3 percent of all General Use airports)

As shown, almost all manufacturing activity is located at Major, Regional, and Community airports, with the largest percentage being located at Major airports. Because this type of activity likely necessitates a larger population center as well as significant support facilities at the airport, it is to be expected that aerospace manufacturing activity is more highly concentrated at larger facilities.

Aerospace manufacturing is a highly sought-after aviation activity as it can contribute to high levels of revenue generation and creation of jobs at an airport and for the community. From leasing land to fuel sales, the manufacturers generate revenue and activity that is not easily replaced by other aviation activities.

Figure 7-7. Aerospace Manufacturing Activity by Region



Source: Washington State Department of Transportation, Aviation Division

Activities Summary

The previous analysis of the locations of significant activities throughout the state provides data that can be used as WSDOT and the airports evaluate alternative strategies for future airport development. Knowing where there are other airports serving different activities and the breadth of the activities that are provided within the state gives airport sponsors and users information that is not typically available through other data sources, nor readily available without time-consuming research.

The activities at the airports also help to shed light on the relationship between airport development needs and the opportunities to increase revenue based on those activities that are likely to generate more demand and potentially more economic activity. Other than agriculture, which is an important aviation activity but one that does not necessarily generate tremendous revenue for airports, the other four activities are typically provided at airports that support many other activities and have an important aviation function within the state.

7.3.3 System Accessibility

The third component in the regional evaluation is the accessibility of the state's airport system to population. The accessibility was analyzed related to general aviation as well as commercial service.

To understand how the aviation system is serving the state's population and its accessibility to populated areas, a drive time analysis was completed using the ESRI Community Analyst. This analysis examined the population of Washington that is located within standard driving times for both general aviation and commercial service airports. For the WASP, 30-minute drive times were used for general aviation service areas as this is a standard used by FAA in evaluating airports eligible for inclusion in the National Plan of Integrated Airport Systems (NPIAS). This drive time represents an average that most general aviation aircraft owners are willing to drive to an airport, although it is recognized that owners will drive further to access an airport that provides certain facilities and services desired by the aircraft owner. In addition to traditional 30-minute drive times, 45-minute drive times were analyzed for the entire system to evaluate the differences and additional population that had this level of accessibility for general aviation purposes.

For commercial service airports, 60 and 90-minute drive times were developed. Airports such as SEA and GEG attract commercial service passengers from a larger service area due to the higher levels of service that are provided including more airlines and more flights. For these two airports, 90-minute drive times were used. For the remaining commercial service airports, 60-minute drive times were used to evaluate the accessibility of the existing commercial service airports.

To better understand the coverage and accessibility analysis, other factors that affect the locations of airports and their service areas were examined. The Northwest region is home to the largest commercial service airport in the state as well as the largest population center (Seattle) while the Eastern region has the second largest population center (Spokane). These large population centers typically require more airports and services to support the population and economies of these areas. Much of the Olympic region is covered by the Olympic National Park and Forest, and therefore has large areas that do not have easy access to an airport. The North Central and South Central regions are both impacted by North Cascades National Park and Mt. Baker-Snoqualmie and Wenatchee National Forests which also limit the population base and airports that would be supported in the regions. These protected areas cover a significant portion

of these regions and limit the population and developable areas. The South Central region also has a large area that is covered by the Yakama Indian Reservation and the Southwest region contains the Gifford Pinchot National Forest, both which reduce the need for airports that could be supported by the lesser population densities. Analysis of these areas indicate that approximately 27 percent of the state's land area is within these protected areas. As part of the accessibility evaluation, these areas were further examined to graphically depict and evaluate the impact of the significant size of these areas.

General Aviation Airport Drive-Times

Analyses presented in the maps below show that, when all system airports are considered with 30-minute drive times representing the accessibility of airports for general aviation users, 64 percent of Washington's population is within a 30-minute drive of at least one and, in some cases, multiple system airports. The coverage or accessibility analysis identifies that there are multiple areas that have overlapping service and other areas that have gaps or do not have easy access to airports in the Washington system.

An additional effort was conducted to determine the percentage of the statewide population within a 30-minute drive time of the five airport classifications. Table 7-10 shows the percentage of Washington's population that is located within a 30-minute general aviation drive time of any airport in the different classifications. As shown, 31 percent of the population is within a 30-minute drive time of a Major airport. While general aviation is not the primary activity at most of the Major airports, these airports do serve a role in accommodating general aviation activity. This coverage is graphically depicted in Figure 7-8. When 30-minute drive times of Regional airports are added to the coverage provided by Major airports, 45 percent of the state population is covered. This information is shown graphically in Figure 7-9. Figure 7-10 presents the coverage provided by system airports when the 30-minute drive times of Community airports are added. For this grouping, 59 percent of the state population is located within a 30-minute drive time of these airports. When Local airport drive times are included, 61 percent of the statewide population is covered by 30-minute drive times. This information is depicted in Figure 7-11. To complete the analysis, Figure 7-12 details the coverage when General Use airports are included and all classifications are analyzed.

Table 7-10. Percent of Statewide Population within a 30-minute Drive Time of System Airports by Classification

. AIRPORT CLASSIFICATION	PERCENT OF POPULATION COVERAGE BY INDIVIDUAL CLASSIFICATION	PERCENT OF CUMULATIVE POPULATION COVERAGE
All System Airports	64%	N/A
Major	31%	31% (Major Only)
Regional	56%	45% (Major + Regional)
Community	34%	59% (Major + Regional + Community)
Local	5%	61% (Major + Regional + Community + Local)
General Use	30%	64% (all five classifications)

Source: ESRI Community Analyst.

Figure 7-8. 30-Minute Drive Times of Major Airports

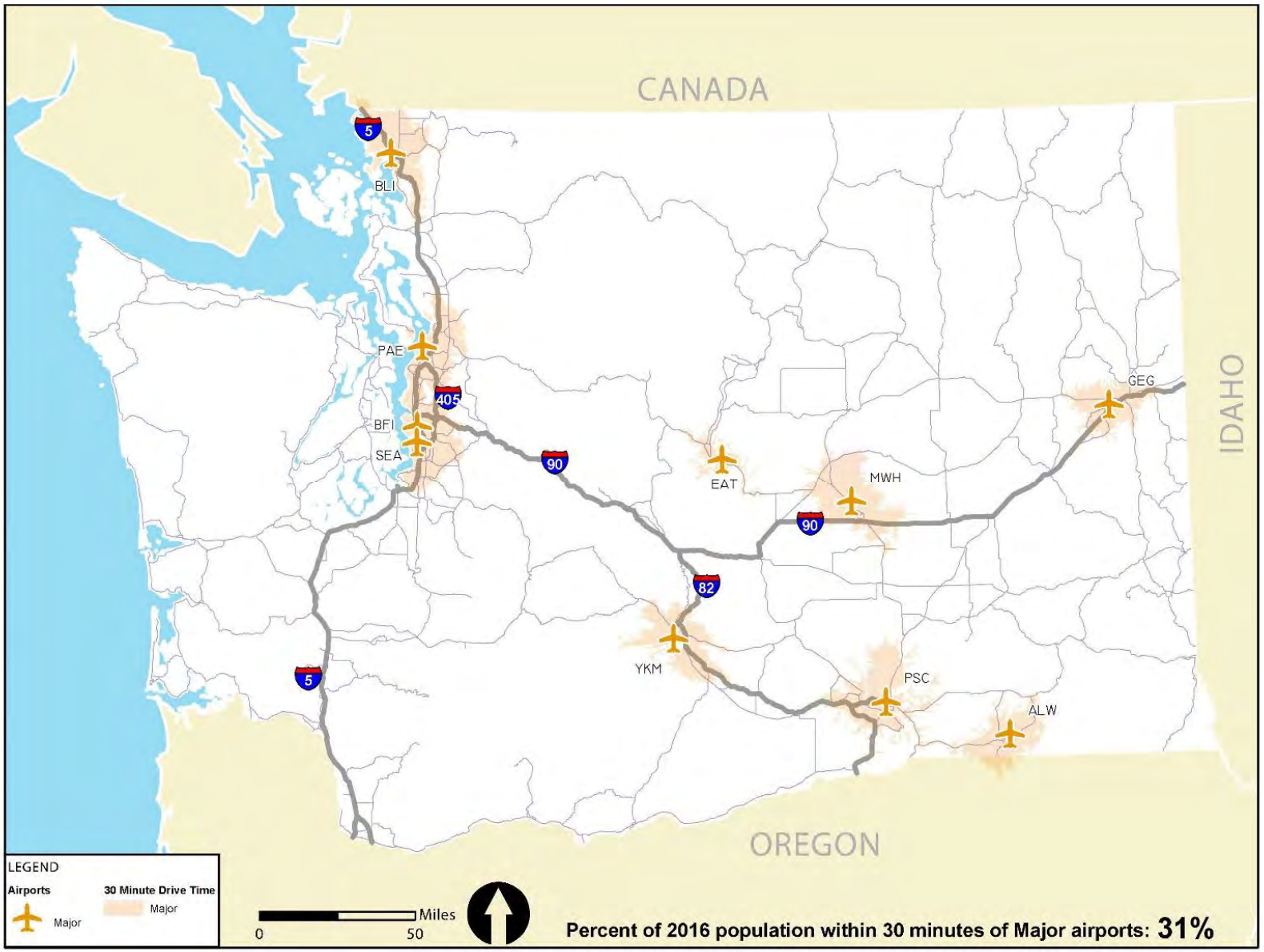


Figure 7-9. 30-Minute Drive Times of Major and Regional Airports

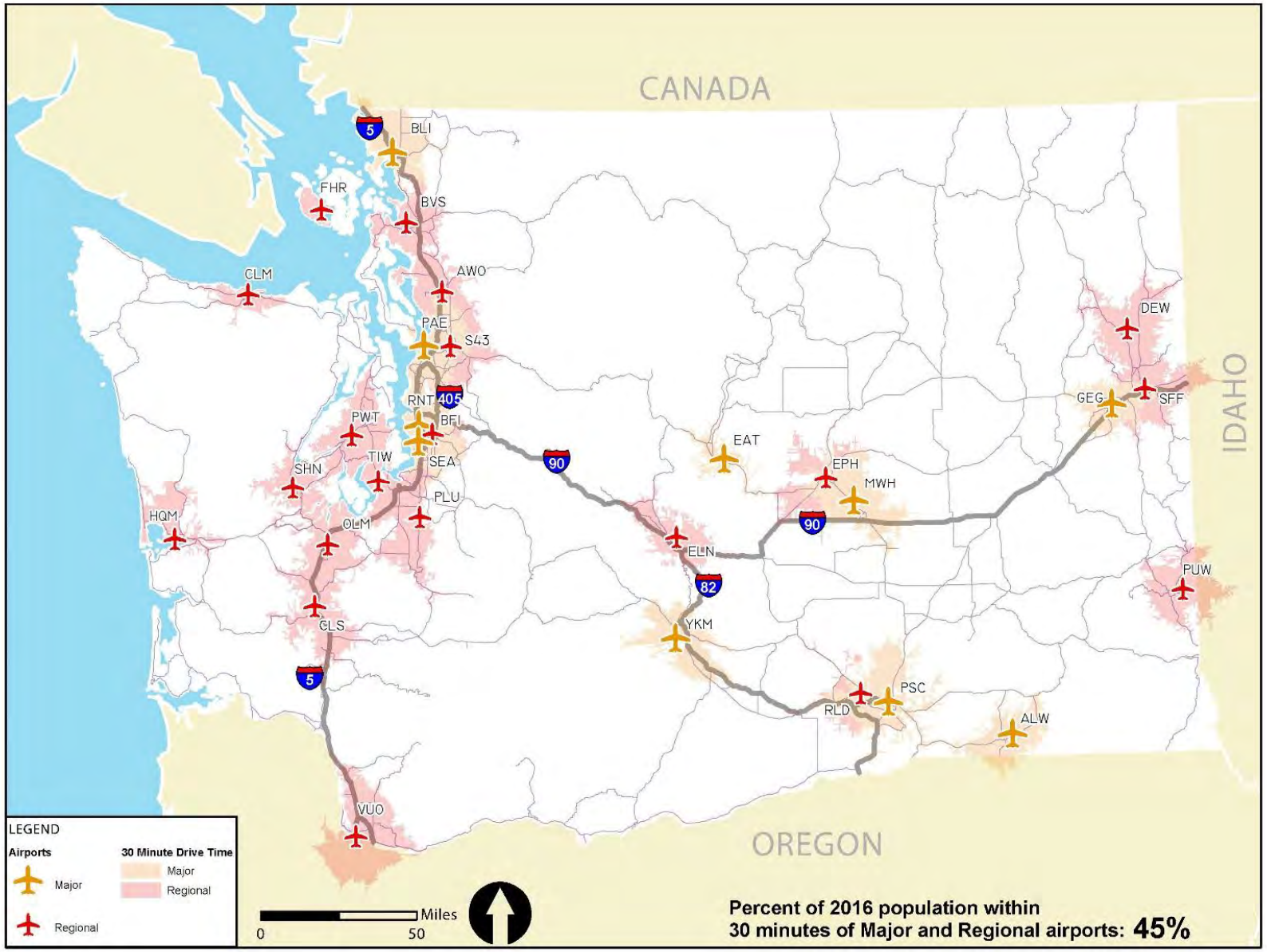


Figure 7-10. 30-Minute Drive Times of Major, Regional, and Community Airports

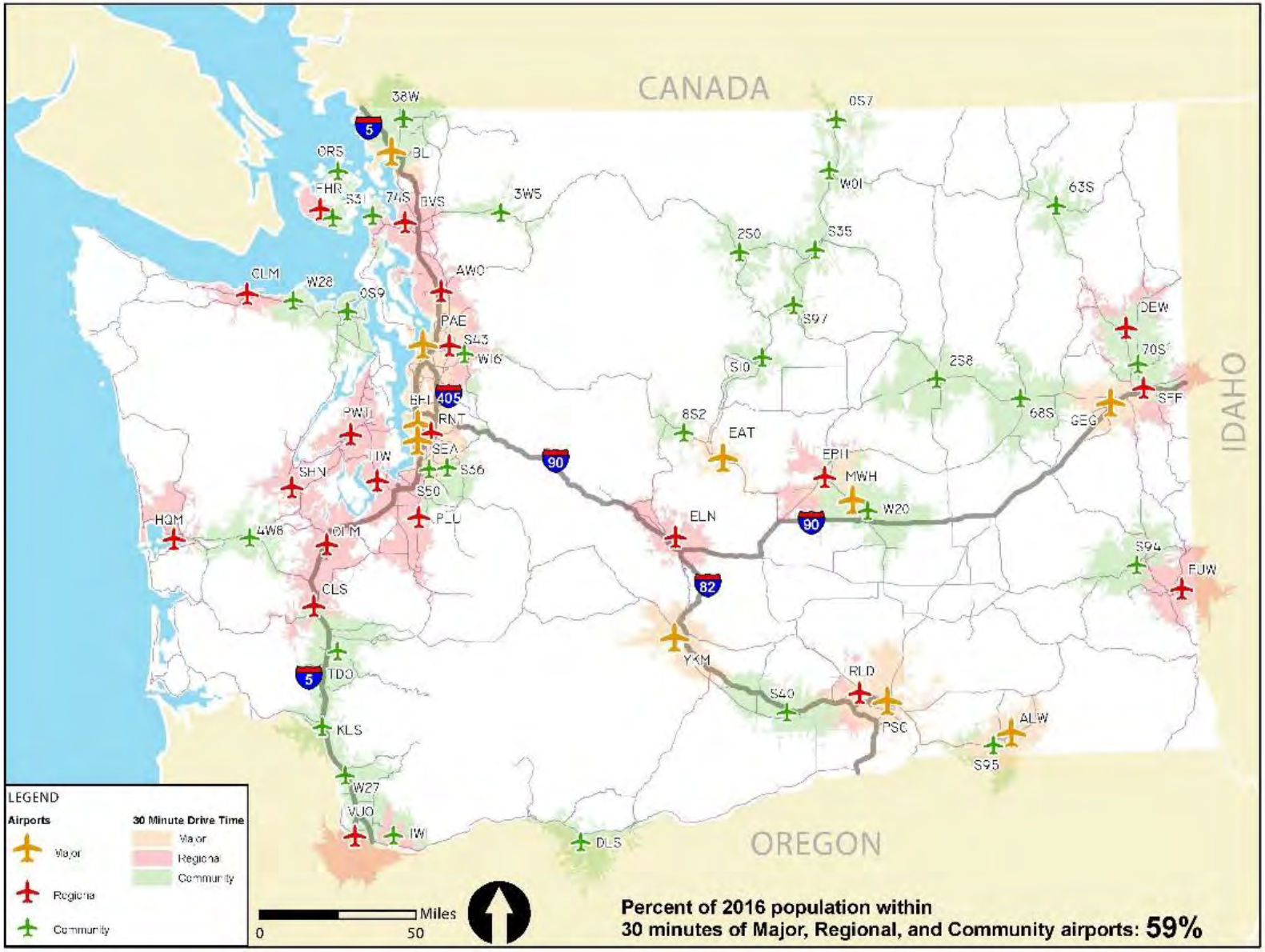


Figure 7-11. 30-Minute Drive Times of Major, Regional, Community, and Local Airports

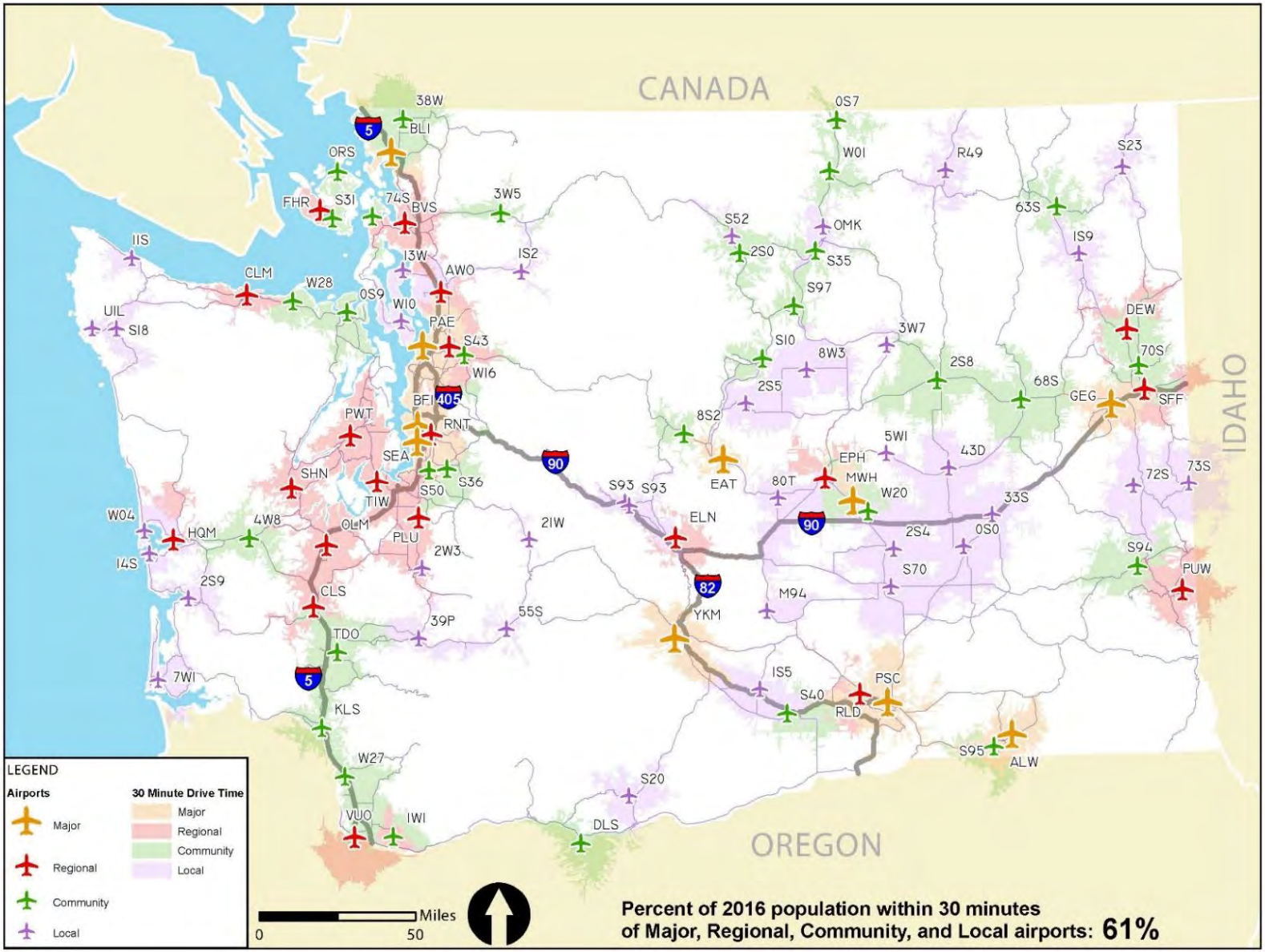
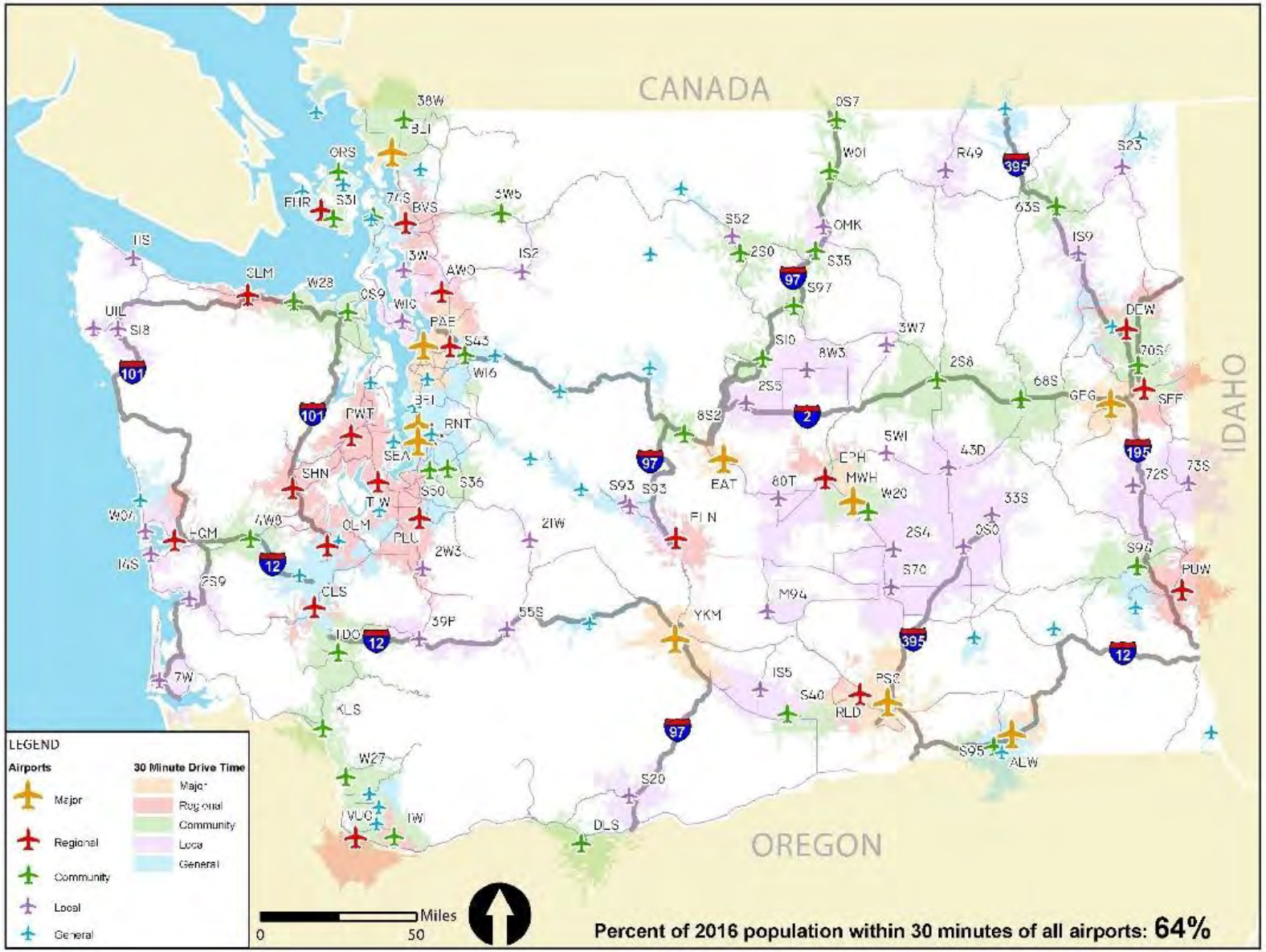


Figure 7-12. 30-Minute Drive Times of All Airports



As shown in the figures and in the table, when all airports in the system are analyzed, 64 percent of the state's population is within a 30-minute general aviation drive of a Washington airport, representing less than two-thirds of the state's population. The identified protected areas were also mapped in comparison to the 30-minute drive times associated with general aviation users and drive times of the five airport classifications. These are depicted in Figure 7-13. The maps depict the moderate overlap of drive time areas for population coverage, particularly in the Northwest region and around major population centers where general aviation users have multiple options for accessing the system. This accessibility is important to consider as an element of the transportation system's service to the state. Many individual airport pilots and businesses utilize aviation for recreational and business purposes and those areas without reasonable access to an airport are less likely to attract population and economic development opportunities.

While the analysis shows that less than two-thirds of the state's population is within a 30-minute drive of a Washington airport that provides access for general aviation users, the following should also be considered relative to the accessibility of the system:

- Airports in Oregon, Idaho, and Canada provide additional coverage to support populations near the borders of the state
- Many of the areas that do not have airports are undevelopable lands due to terrain or their protected status (National Park, National Forest, etc.) that have sparse population
- There are also many privately owned, private use airports throughout the state that provide access to approved users

For comparison purposes, 45-minute drive times were also considered for the state's system of airports. If the 30-minute drive time is expanded by 15 minutes, the percent of the state's population that is in proximity to an airport increases to 97 percent (see Figure 7-14). While beyond the traditional service area considered for general aviation airports (30 minutes), the 45-minute drive times indicate that nearly all of Washington's residents have relatively good access to at least a public-use general aviation airport in the state's system.

Figure 7-13. 30-Minute Drive Times of All Airports with Protected Areas

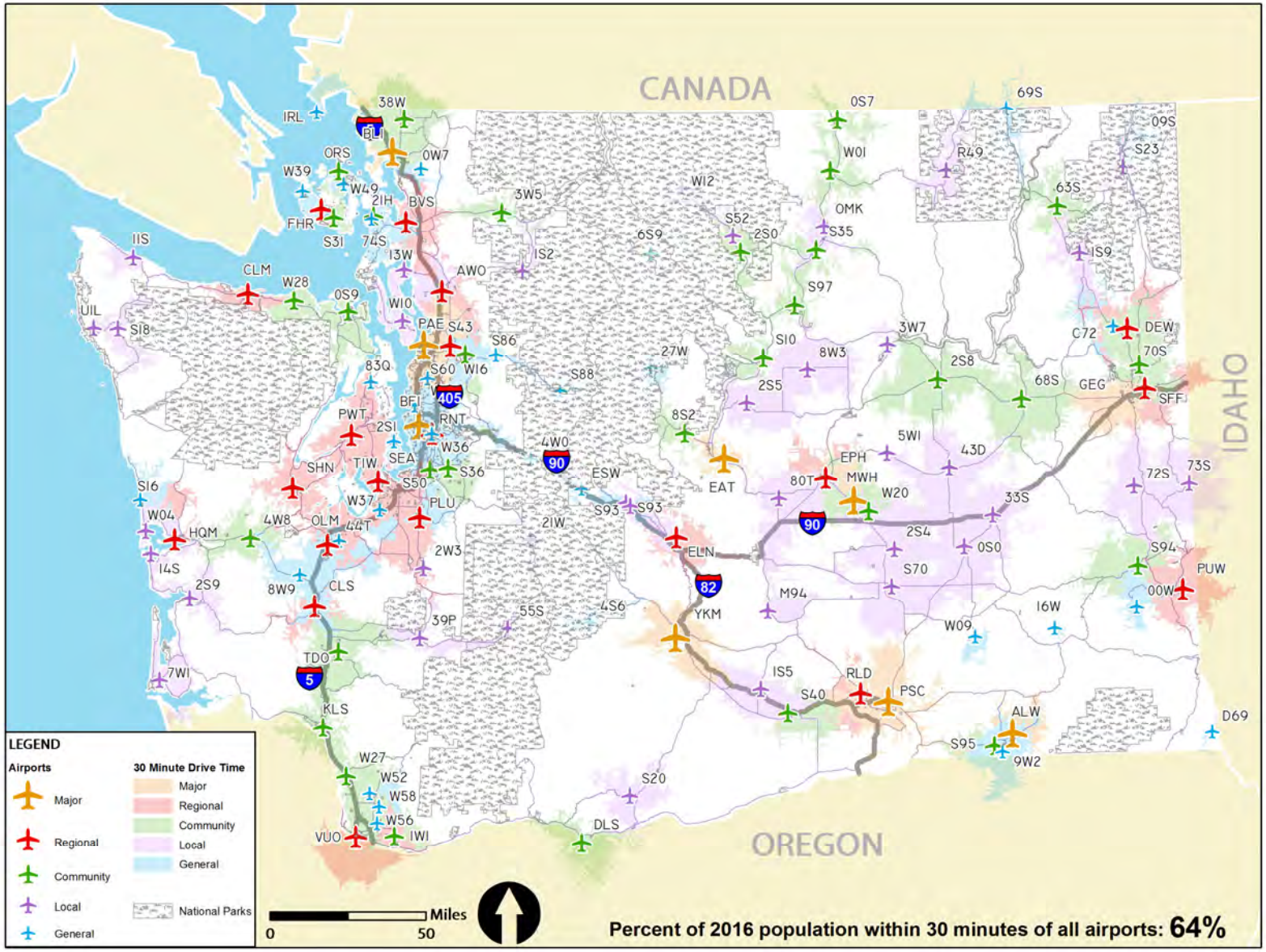
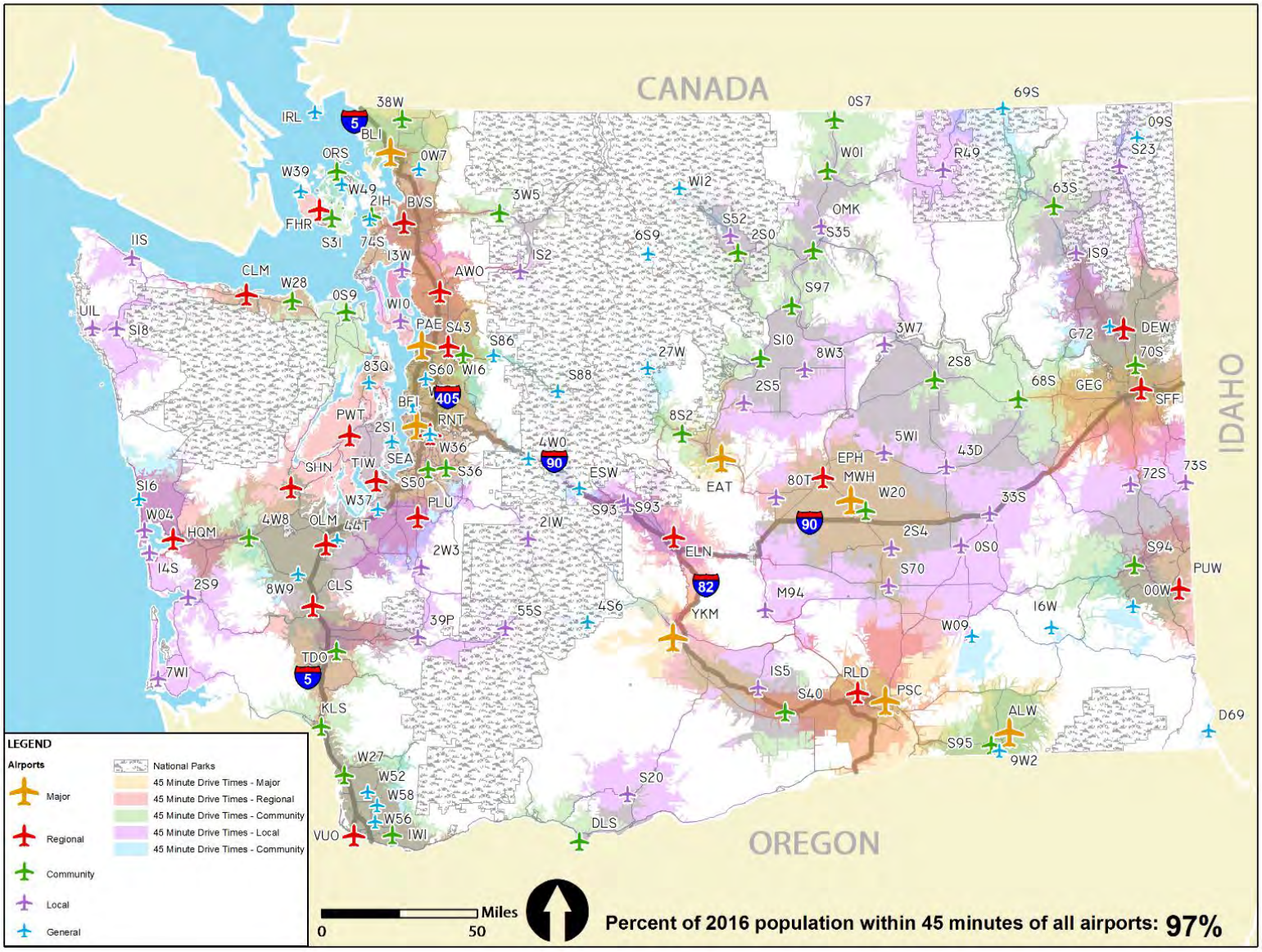


Figure 7-14. 45-Minute Drive Times of All Airports with Protected Areas



Commercial Service Accessibility

Another important component of system accessibility is the access to commercial service airports. Commercial service airports provide an opportunity for Washington residents and visitors to travel around the world and serve an important function in supporting economic growth and diversification. While the distance that commercial airline passengers are willing to travel varies, standard travel times of 60 and 90 minutes are used to evaluate the accessibility. For airports such as SEA and GEG which have numerous airlines and flights per day, passengers are willing to drive further to access these airports. Ninety-minute service areas were used for these two airports, although it is possible that passengers are driving further depending on factors such as price, destination, airline, and flight frequency. For the remaining commercial service airports in the state that have fewer airlines and serve smaller service areas, 60 minutes was used to evaluate the accessibility of the system.

Figure 7-15 depicts the 90-minute service areas for SEA and GEG and reveals that approximately 67 percent of Washington's population is in these service areas. The other commercial service airports provide access to 67 percent of the population (see Figure 7-16). When combined and overlaps are removed, as well as the protected areas are considered, Washington's commercial service airports coverage supports 83 percent of the population as shown in Figure 7-17. While there are areas of the state that must drive further to access commercial airline service, this level of coverage is considered adequate for a state, especially the size of Washington and with significant terrain.

Figure 7-15. Commercial Service Accessibility – SEA and GEG 90-Minute Drive Times

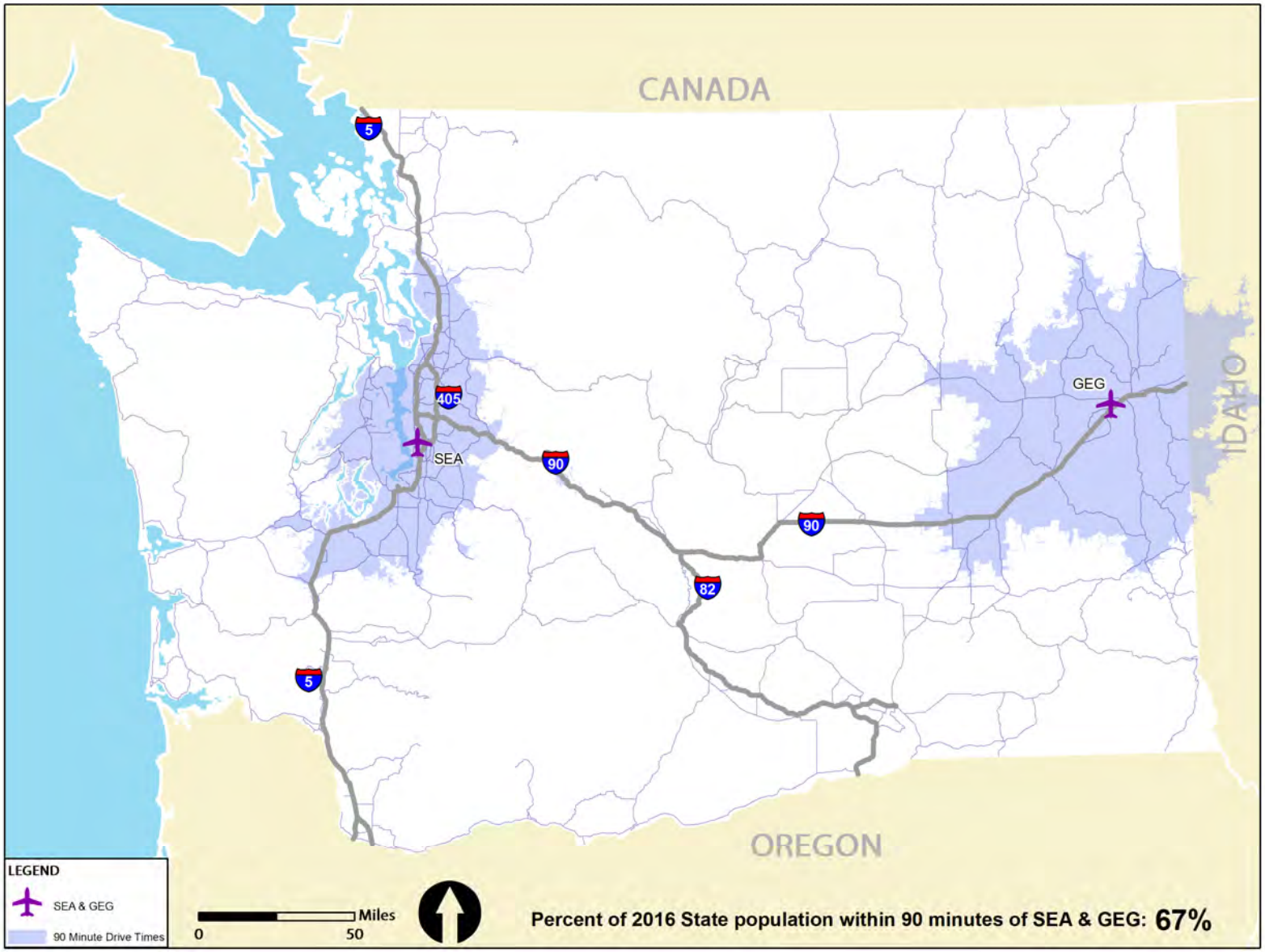


Figure 7-16. Commercial Service Accessibility – Other Commercial Airports 60-Minute Drive Times

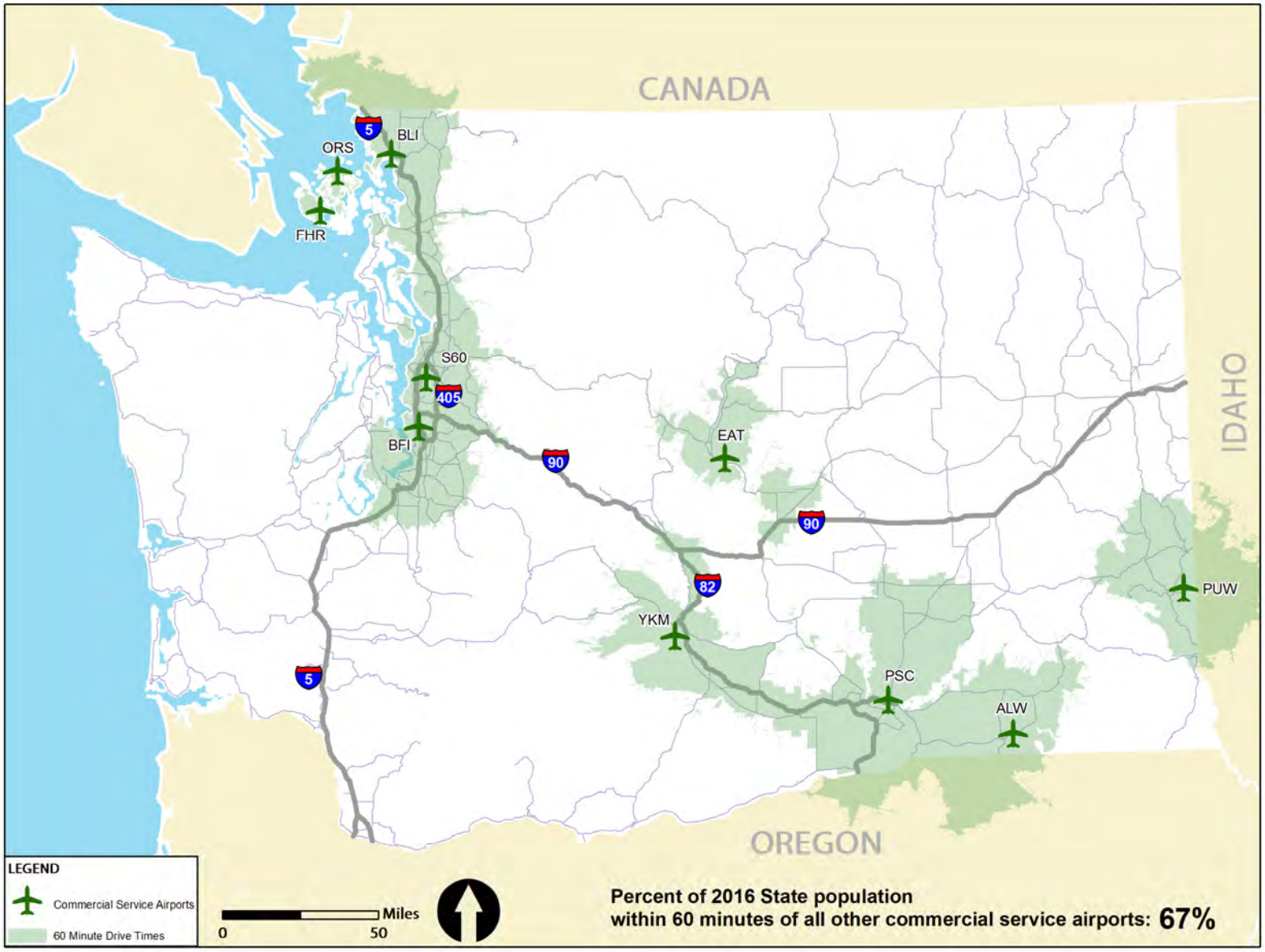
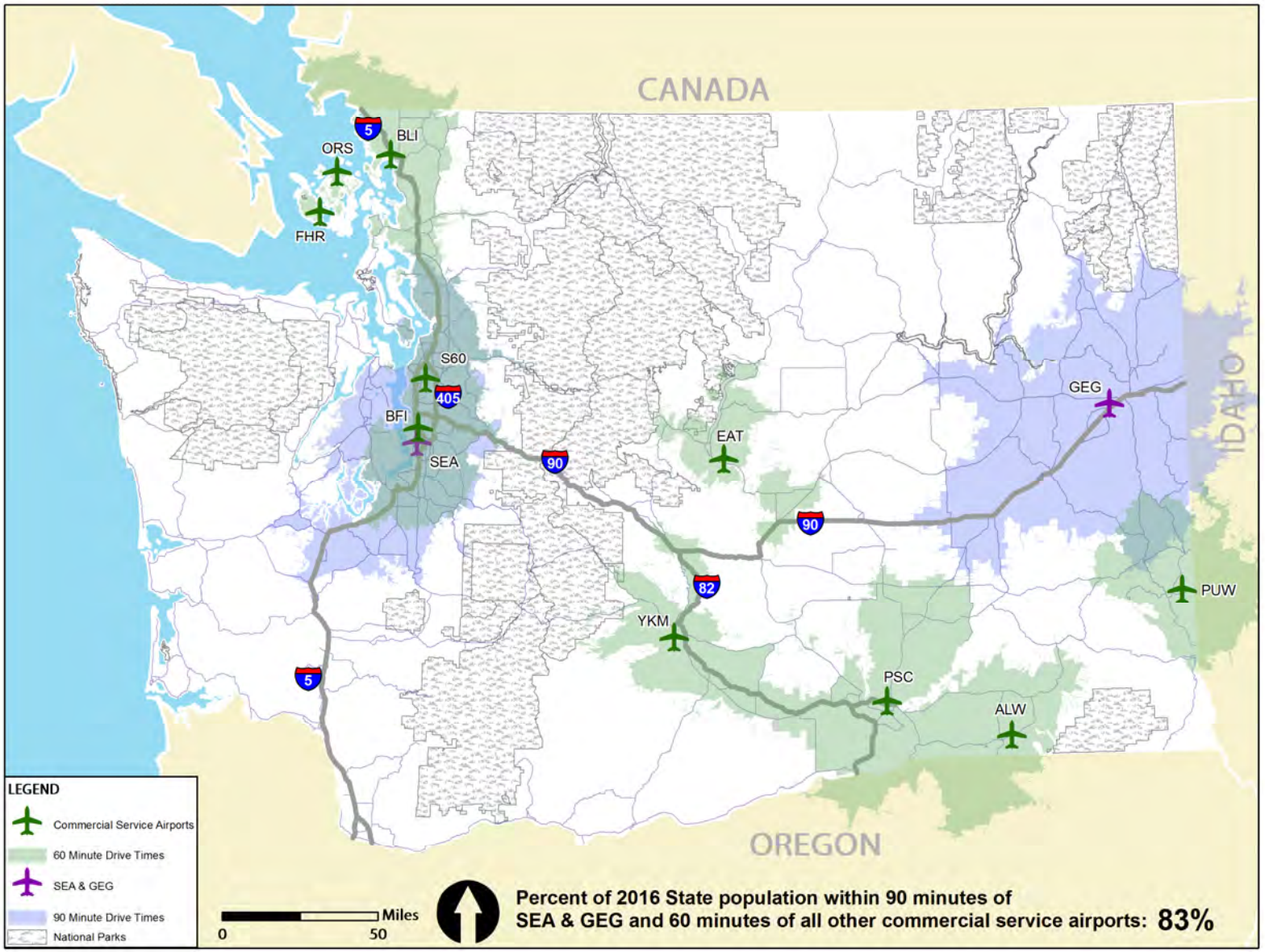


Figure 7-17. Combined Commercial Service Airport Accessibility



Business User Accessibility

In addition to general accessibility of the overall public airport system, accessibility for business user purposes was also examined. Previous analyses identified the airports that self-reported business and corporate travel activities. That analysis showed 52 airports that reported serving this activity, including 29 airports in the Community, Local, and General Use categories and 25 in the Major and Regional categories. Many of the Community, Local, and General Use airports are serving business and corporate users that travel in smaller, lighter weight aircraft that can operate on shorter runways with lower weight bearing capacities. These are sometimes referred to as commerce and/or volunteer activities as opposed to business or corporate aviation and include activities such as flight schools, crop dusting, Part 135 air taxi, and package cargo. Several of these activities were discussed in previous sections, identifying where these activities are occurring according to airport-reported data. It is worthwhile to note that of the 52 airports reporting this activity, 31, or more than half, support smaller business aviation aircraft. While it is difficult to measure the economic contribution of these operations, these statistics highlight the important role airports serve in meeting business aviation travel.

The emphasis of the evaluation of business user accessibility is on larger corporate aircraft that generally require larger and more extensive airfield infrastructure and other attributes typically desired by business users. The following were identified as the typical attributes needed to support the average business user:

- 5,000-foot long runway
- JetA fuel
- At least a non-precision approach
- AWOS

Across the state, there are 21 airports that have all four of these attributes to serve larger corporate users. While each WSDOT region has at least one airport that has all four attributes, indicating they can support the average business user needs, they are primarily located in the Northwest and Olympic regions. Figure 7-18 displays the airports that that meet the four attributes of average business users. As depicted, these airports are Major and Regional and are located throughout the state, but there are many areas that do not have an airport in proximity that can accommodate an average business user's needs.

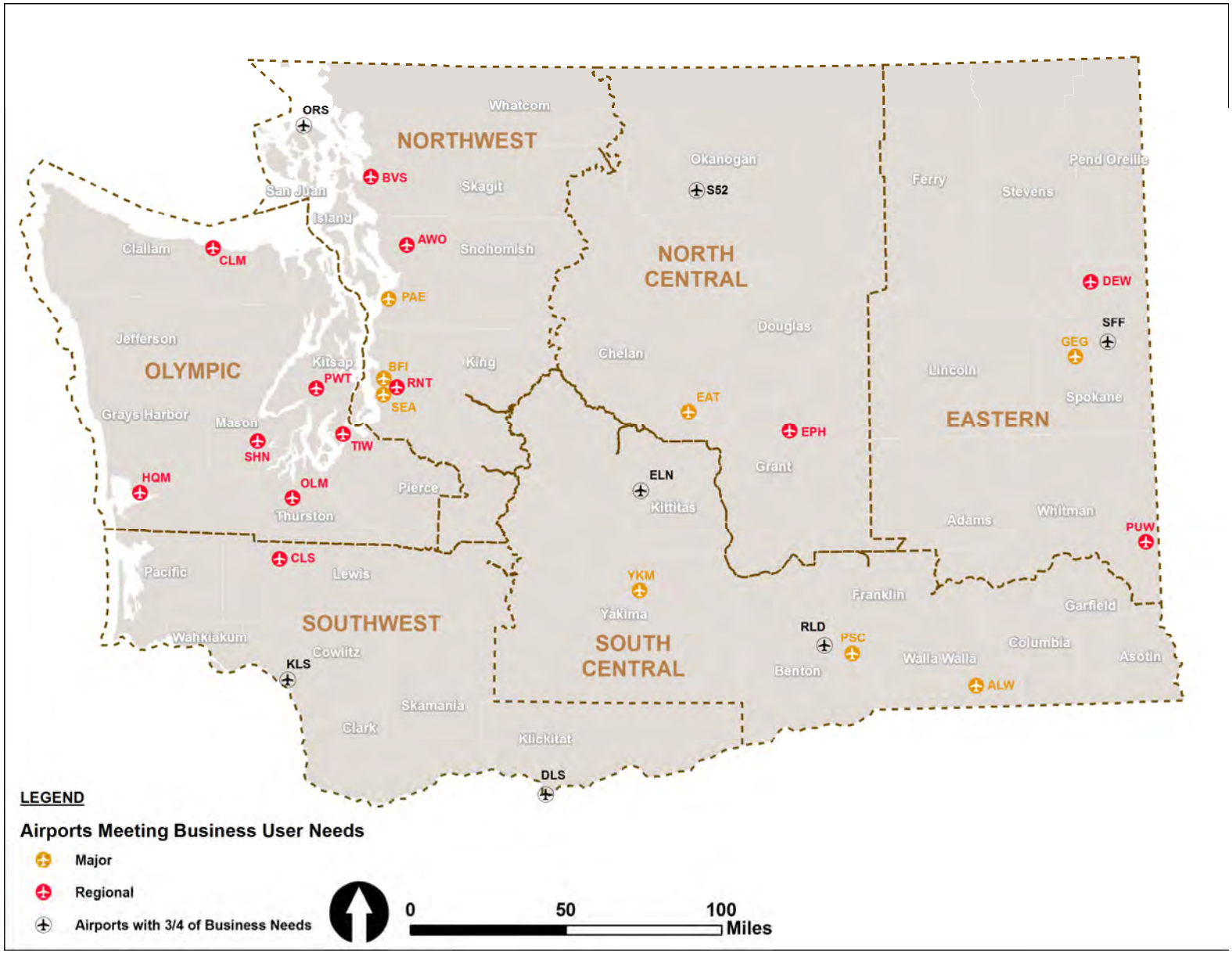
An analysis was conducted to also understand which airports currently have three of the four attributes needed to support business activity. This was done to understand the potential for supporting business activity in areas that may currently have limited access for these users. The analysis indicated there are seven airports that have three of the four attributes (these airports are also depicted in Figure 7-18):

- All seven have both JetA fuel and AWOS systems
- Three have at least a 5,000-foot long runway but do not have at least a non-precision approach
    - Of these, there is a Local airport located in the North Central region, a Community airport located in the Southwest region, and Regional airport located in the South Central region
        - Columbia Gorge Regional/The Dalles
        - Bowers Field
        - Methow Valley State (Winthrop)
- Four have at least a non-precision approach but do not have at least a 5,000-foot long runway

- Of these, there are two Regional airports (one located in the Eastern region and one located in the South Central region) and two Community airports (one located in the Southwest region and one located in the Northwest region)
    - Felts Field
    - Southwest Washington Regional
    - Orcas Island
    - Richland

If these airports could secure the fourth attribute, all regions would have an airport that provides the infrastructure needed by the average business user which would increase the opportunities for business expansion throughout the state. Though there is a good distribution of coverage, the overall number of facilities that have the potential to support business activity is still low.

Figure 7-18. Airports with Attributes to Meet Average Business User by Region



Accessibility Summary

The accessibility evaluation revealed that less than two-thirds (64 percent) of the state's population is within a 30-minute drive of a Washington airport that provides access for general aviation users, however, if the service areas are expanded to 45 minutes, this increases to 97 percent. It was noted that while the 30-minute coverage seems low, there are several factors that impact the accessibility for general aviation users and that this analysis is conservative. The increase in coverage to users by driving an additional 15 minutes reveals that providing additional general aviation airports for accessibility is not warranted. Throughout the WASP and in previous studies, there has also not been an identification of a need for a new airport to serve an existing community. Finally, through airports located just beyond Washington's borders to private airports located throughout the state, the accessibility for the state's population is considered very high.

In terms of commercial service accessibility, the state's two largest airports are within 90 minutes driving time of over two-thirds of the population. By adding in 60-minute service areas for the remaining commercial service airports, the coverage increases to 83%. As previously noted, these are standard drive times and many people are willing to drive further for a variety of reasons to reach an airport served by a commercial airline. This level of coverage or accessibility is considered adequate. It is important to note that the provision of commercial service is an airline decision and that recent trends in the national airline industry have resulted in overall reductions in frequency and number of airlines and the number of airports with airline service has declined. Washington continues to have service at many airports across the state, providing access for residents and visitors.

The analysis of the state's accessibility for business aircraft has shown there are airports that could be improved to offer the typical attributes that business users are looking for to operate at an airport, however, the provision of the attributes does not indicate that business operators will necessarily operate at those airports. The existing Washington aviation system provides an extensive array of airports of different sizes and serves population centers throughout the state.

7.4 Airport Alternative Strategies

The prior statewide and regional airport needs and strategies provide the "bigger picture" perspective on the future opportunities for the state's airport system to address system needs in the context of emerging issues, aviation activities, and demand constraints. The airport alternative strategies provide specific opportunities on strategies that airports can consider to increase revenue, serve customer needs, create a competitive advantage, or bring relevance of the airport to the communities that are served. The airport alternative strategies focus on the options available to leverage the positive opportunities and mitigate risks to the future of the airport and system.

During the WASP, 17 aviation activities, 8 emerging issues, and 18 airport metrics were identified. Some of the aviation activities, emerging issues, and metrics are likely to have a greater potential to impact the options available to an airport. As an example, blood and organ transportation is one of the 17 aviation activities. While this activity is a critical medical need and could possibly be increased at an airport, it is more of an indirect impact to the airport and is not likely to result in a sustained increase in revenue or create a competitive advantage to the airport since the activity is likely tied to factors beyond the control of the airport or the community.

WSDOT convened a working group to develop a set of strategies that were aligned with WSDOT's and the WASP's goals and objectives. The methodology used can be applied by others to develop additional strategies that are specific to the needs and desires of their airport and community. To guide the working group, a three-step process was proposed. The first step was to determine a category that the strategy could be applied to, indicating what type of action would be necessary. As shown in Figure 7-19, five categories were identified: Infrastructure Improvements, Education and Training, Stakeholder Collaboration, Industry/Community Partnerships, or Planning. Infrastructure Improvements address a physical attribute at the airport to support the strategy, including the addition of infrastructure. Education and Training would provide learning opportunities through various media methods on the selected topic. Stakeholder Collaboration involves the applicable stakeholders in the information gathering stage or implementation. Industry/Community Partnerships would include working directly with other agencies and organizations to mutually advance the airport and aviation industry. Planning addresses the research and analysis that would be conducted to provide strategic visions and implementation plans for the airports.

Figure 7-19. Alternative Strategy Categories

The second step in alternative strategy development is to select a focus area such as Airport Metrics, Emerging Issues, or Aviation Activities, as shown in Figure 7-20. The focus areas allow an airport to hone in on a specific topic related to aviation element that they wish to improve upon. Airport Metrics were developed to provide guidance for airports to meet the WASP goals and are discussed in detail in Chapter 6. Emerging Issues are topics that have been identified as impacting the future the aviation industry either from a physical standpoint or a policy perspective. Aviation Activities are the 17 types of activities that are conducted at airports within Washington State.

Figure 7-20. Alternative Strategy Focus Areas

The goal is to develop strategies that achieve specific objectives or outcomes as shown in Figure 7-21. It is possible for a single strategy to provide multiple outcomes.

Figure 7-21. Alternative Strategy Objectives/Outcomes

A process was developed to allow an airport to select a focus area, a category, and a potential objective or outcome to then formulate a strategy. The process is depicted below in Figure 7-22 for the following example:

- An Infrastructure Improvement is desired
- The focus area is an Airport Metric dealing with Aeronautical and Airport Safety
- The objective is to serve the customer's needs

Figure 7-22. Alternative Strategy Development Process

Using this process, a potential strategy could be to:

Conduct an aerial survey and obstruction evaluation to design an obstruction removal project for the primary runway.

While it is possible for a single strategy to integrate multiple categories or focus areas, the emphasis was to formulate strategies that could be implemented in the near term by the airports. It is also possible for a strategy to help achieve multiple categories, such as reconfiguring aircraft hangars to adapt to newer aircraft designs. This strategy could be considered to address Airport Capacity, under Airport Metrics, or Emerging Issues.

Strategies were developed through use of a working group. The working group met to discuss potential airport alternative strategies, utilizing the process identified above with selection of a focus area, a category, and a potential objective or outcome. The results of the working group were synthesized according to the focus areas, with identification of the category and anticipated outcomes. Figures 7-23 through 7-27 display the strategies that were developed through the working group for each of the five strategy categories. All identified strategies are not applicable to all airports, and each airport is encouraged to develop their own strategies using the above methodology or process. It should be noted that while there were a few focus areas for which no strategy was developed during the working group, strategies can be developed for each category and focus area as pertinent to the individual airport and situation.

Figure 7-23. Alternative Airport Strategies – Examples of Infrastructure Improvements

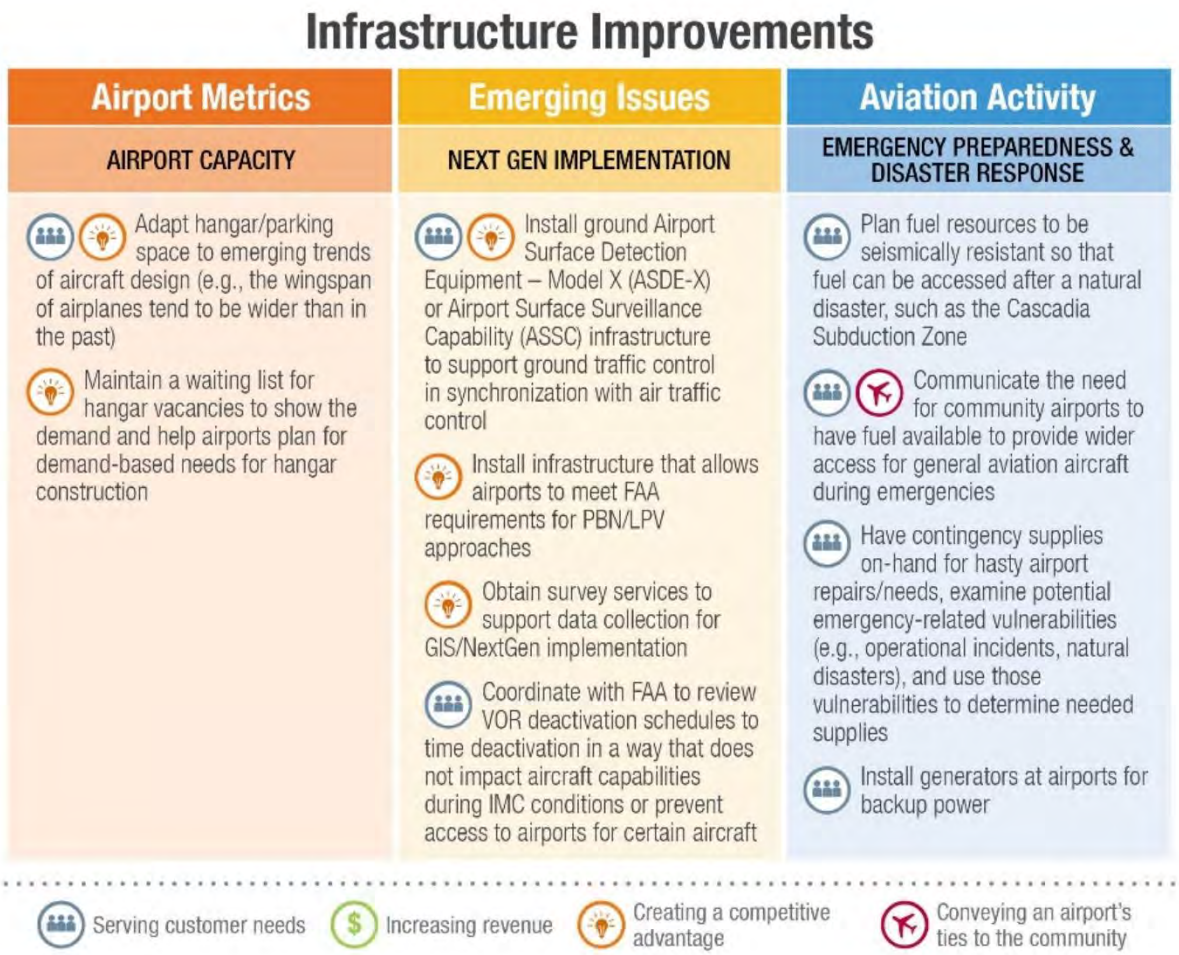


Figure 7-23. Alternative Airport Strategies – Examples of Infrastructure Improvements (continued)

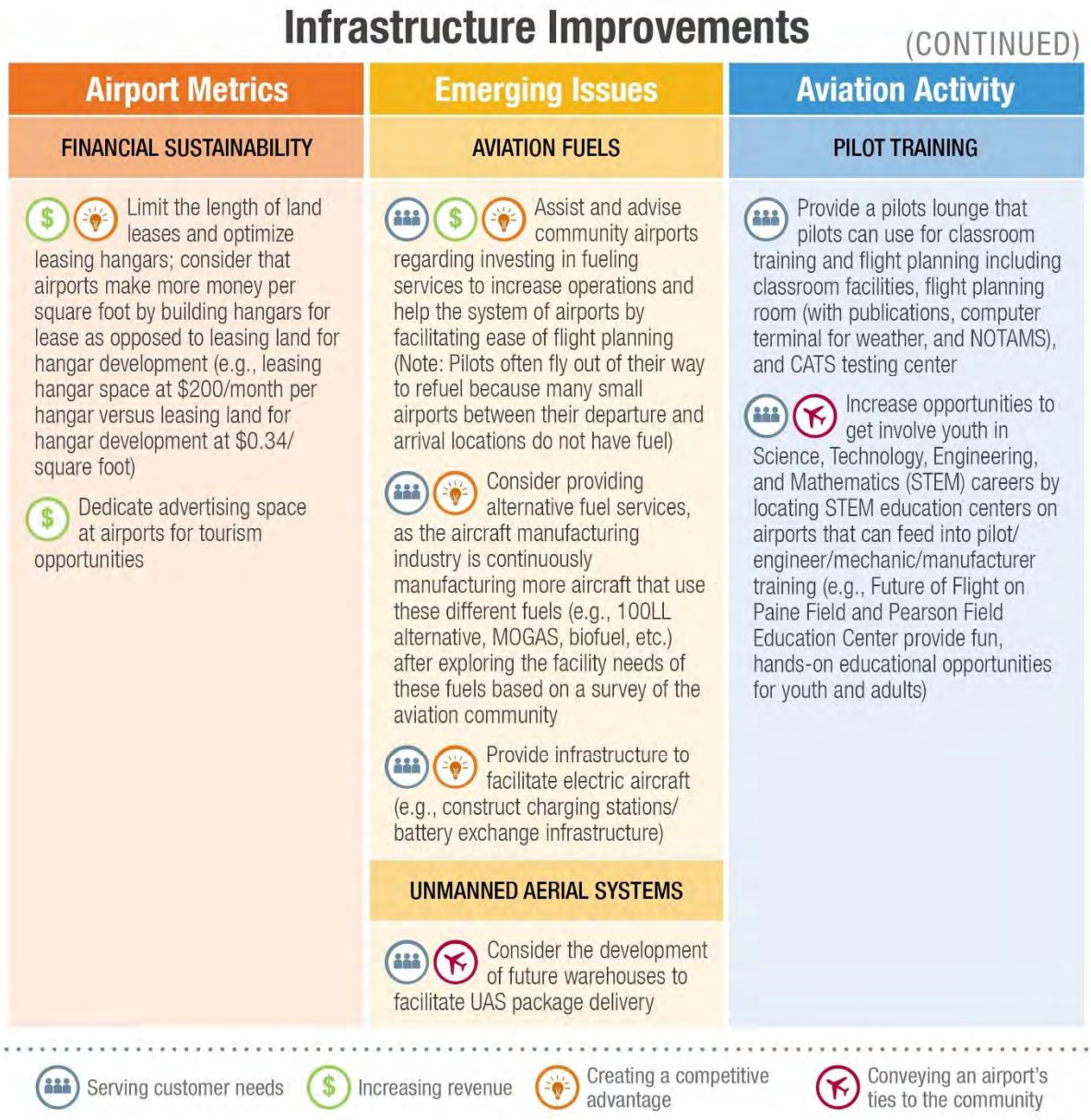


Figure 7-24. Alternative Airport Strategies – Examples of Education and Training

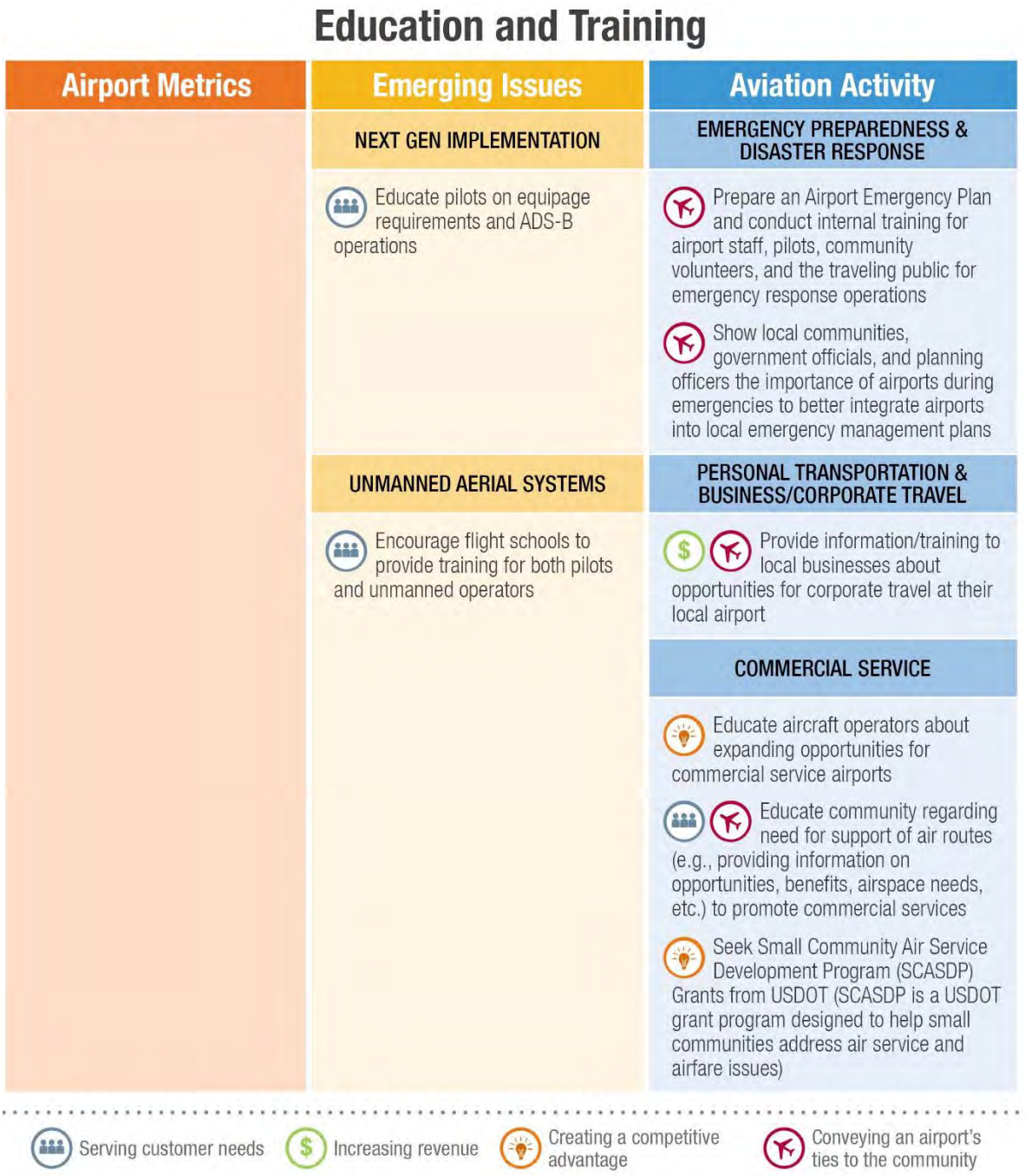


Figure 7-25. Alternative Airport Strategies – Examples of Stakeholder Collaboration

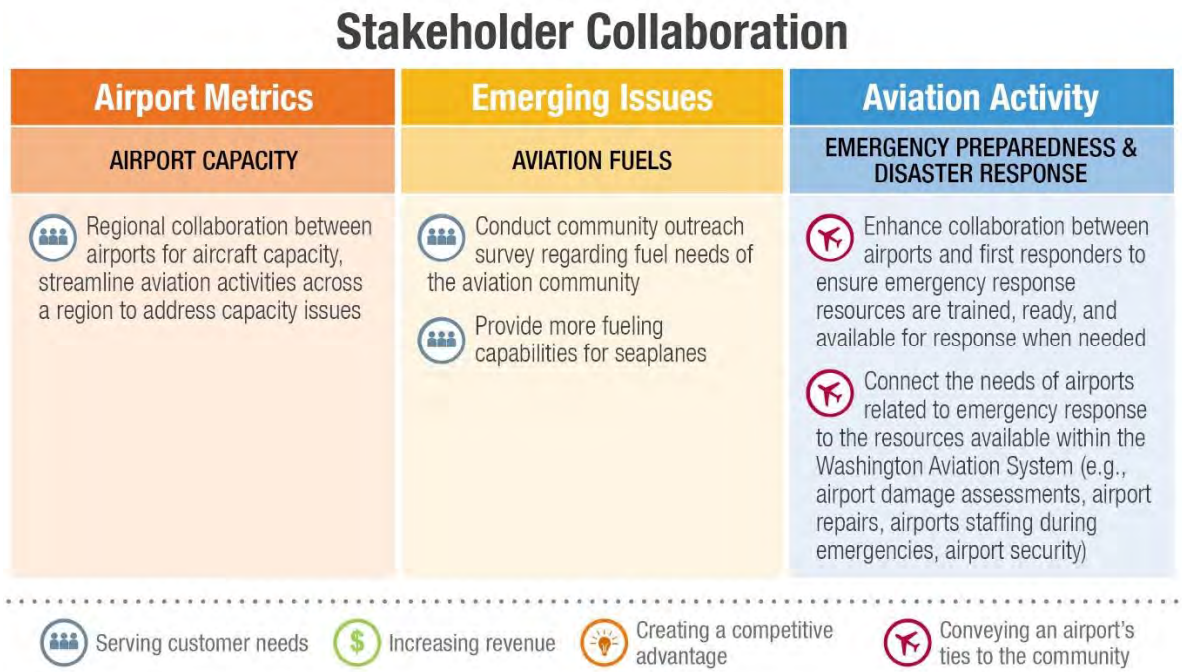


Figure 7-26. Alternative Airport Strategies – Examples of Industry/Community Partnerships

Industry/Community Partnerships (CONTINUED)

Airport Metrics

COMMERCIAL SERVICE

- Ensure TSA supports emerging commercial service airports
- SCASDP Working group
- Community surveys, "*Where would you like to travel by air?*"
- Partnership/collaboration between commercial operators/ services (ex. Alaska, Delta, UPS, and FEDEX at Sea-Tac). Working groups for solutions between commercial services and airport operators

MASTER PLAN UPDATES/LAND USE

- Work with community/ local planners so they can understand the importance of the airport and the needs of the pilots and operators (e.g., include local planners during master plan updates)
- Work with local planners during master plan updates
- Work with WSDOT Aviation to provide guidance to local planners about the needs of the community regarding the airport and the needs of the airport regarding the community

Emerging Issues

UNMANNED AERIAL SYSTEMS

- Incorporate STEM programs for UAS operations

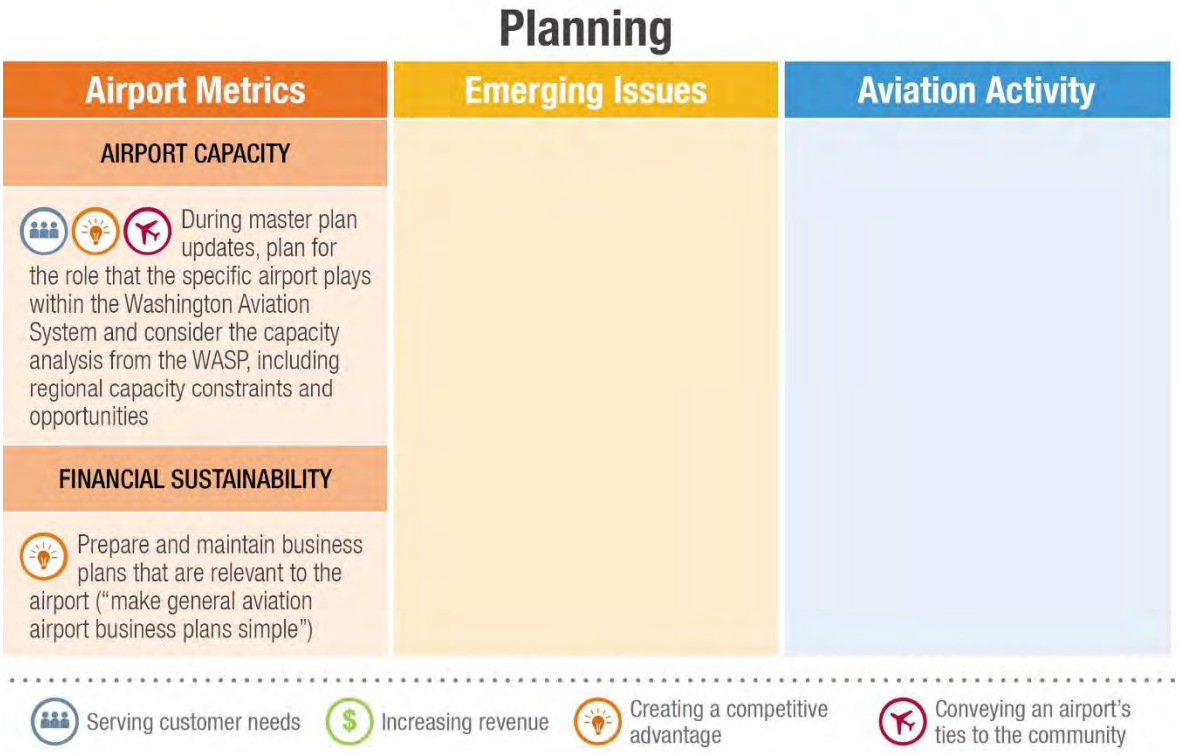
Aviation Activity

COMMERCIAL SERVICE

- Ensure TSA services will be available when developing new commercial service airports
- Educate airport sponsors/ managers about commercial service opportunities/operations through regional SCASDP working groups
- Consider conducting community surveys: "Where would you like to travel by air?"
- Enhance partnerships/ collaboration between commercial operators/services (e.g., Alaska, Delta, UPS, and FEDEX at Sea-Tac) through working groups to identify problems and solutions between commercial services and airport operators

Serving customer needs | Increasing revenue | Creating a competitive advantage | Conveying an airport's ties to the community

Figure 7-27. Alternative Airport Strategies – Examples of Planning



7.5 Summary

The information from the WASP serves as input in the decision-making process as WSDOT, regional organizations, and individual airports move toward enhancing the system's ability to meet demand and support the system users and communities throughout the state that rely on aviation. The analysis examined all three perspectives, providing options for consideration at each level.

The statewide analysis of opportunities related to emerging issues shows that there are numerous actions that can be considered by WSDOT to support emerging issues. These actions range from conducting outreach to engaging support related to infrastructure funding challenges.

The regional evaluation identified specific regions of the state with airfield and storage capacity concerns, as well as where existing primary activities are occurring throughout the state. This analysis can be used to identify opportunities for potential activities that are prevalent in Washington that may present revenue streams at airports. In terms of airfield capacity, five airports in the Puget Sound region were identified as likely to experience capacity constraints over the next 20 years. Options to address capacity were documented and it was noted that SEA is evaluating its capacity as part of its ongoing Master Plan. For storage capacity, there are many airports throughout the state that are anticipated to have insufficient storage by 2034 based on the WASP forecasts and evaluation of storage availability.

In addition, analysis of system accessibility on the regional level revealed that two-thirds of the state's population is within a 30-minute drive time of a public use airport to access general aviation services, as well as a 90-minute drive time of either SEA or GEG for commercial service. Larger general aviation service areas of 45 minutes for all airports increases the coverage and accessibility to over 97 percent for general aviation users. Commercial service coverage increases to 81 percent of the state's population when all the commercial service airports are considered, with 60-minute service areas for the remaining commercial airports (not SEA or GEG).

Finally, the airport alternative strategies provide a process that can be used by airports throughout the state to develop relevant strategies that can help to improve service to customers, increase revenue, create competitive advantages, and/or strengthen an airport's ties to the community.